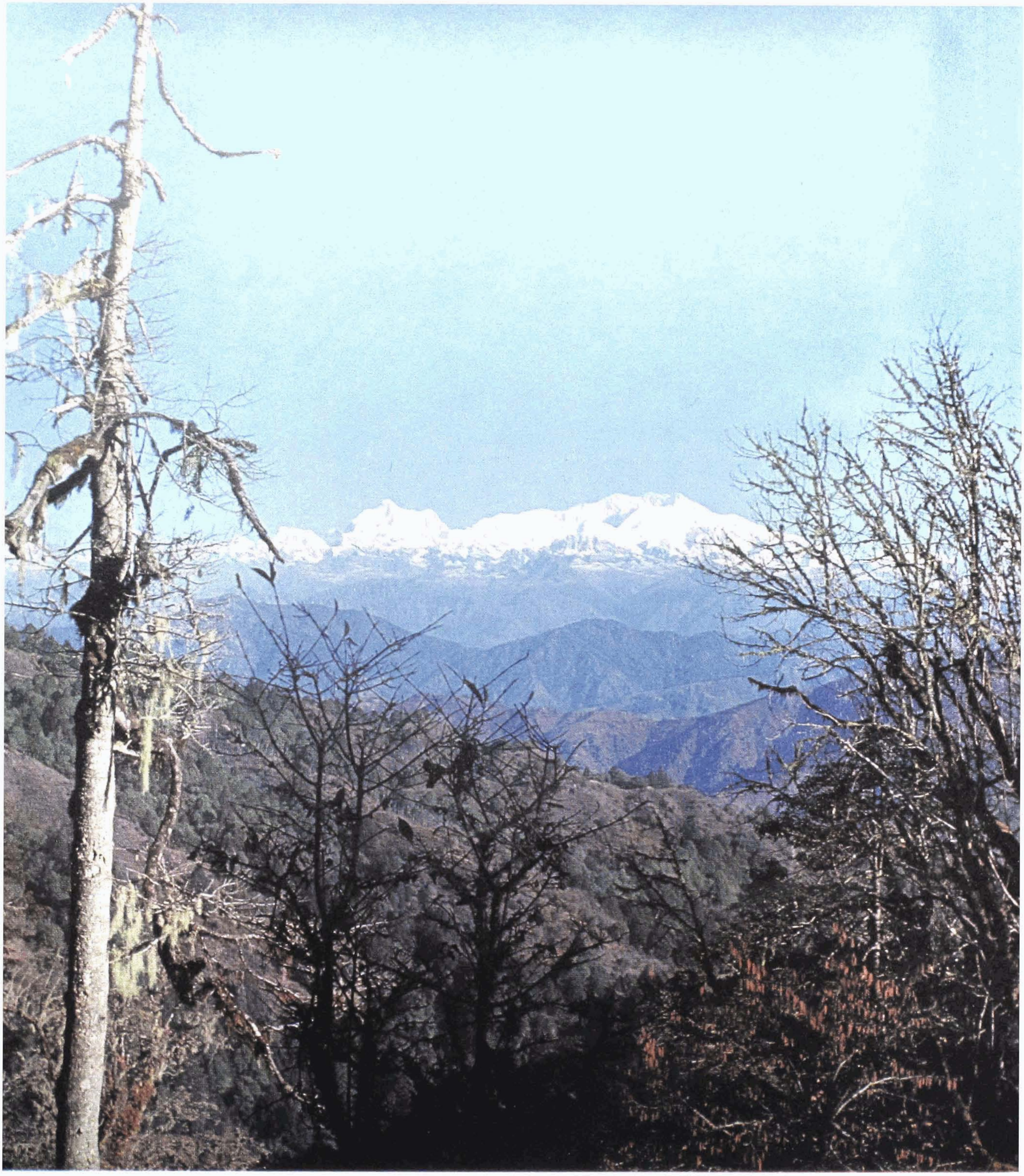

Plate 1. Bhandukay Bhanjang, E. Nepal, alt. 3000 m

THE FLORA OF EASTERN HIMALAYA

Results of the Botanical Expedition to Eastern Himalaya
Organized by the University of Tokyo 1960 and 1963

Compiled by
HIROSHI HARA

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Japan

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PREFACE

This report includes the scientific results hitherto obtained from the Botanical Expeditions to Eastern Himalaya by the University of Tokyo in 1960 and 1963. The main objects of our Expeditions are to make more clear the close botanical relationship between Eastern Himalaya and Japan, to investigate critically the corresponding taxa in both regions, and to analyse the process of evolution in the plant groups originated from a common ancestor in the Early Tertiary and now widely separated in both regions. So we have concentrated our effort to study the temperate flora of Eastern Himalaya in comparison with that of Japan. Our collections consist of about 60,000 specimens which are in many cases supplemented by field notes and coloured photographs. Moreover a large number of vascular plants were brought home as living plants and seeds, and are now cultivated in Japan for our studies.

The First Expedition of 1960 was undertaken as the Indo-Japanese Botanical Expedition to Eastern Himalaya in collaboration with the Birbal Sahni Institute of Palaeobotany at Lucknow. We wish to express our gratitude to Mrs. Savitri Sahni, Dr. K. R. Surange, Dr. R. N. Lakhanpal, Dr. M. N. Bose, and Dr. S. C. D. Sah of the Institute who enabled us to carry out the joint Expedition. The Asia Foundation also generously contributed a grant to our travelling expense. The Second Expedition of 1963 was partly defrayed from a Grant in Aid for Fundamental Scientific Research by the Ministry of Education of Japan.

We are greatly indebted to His Highness Thondup Namgyal, the Maharaja of Sikkim, and Mr. Martam Topden, Dr. K. L. Narashinham, and Mr. K. C. Pradhan of the Government of Sikkim, Dr. P. R. Pandey, and Mr. A. B. Upadhyaya of Department of Medicinal Plants of the Government of Nepal for their kind help for our trips. Thanks are also due to Dr. H. Santapau, Dr. J. G. Sen Gupta, and Dr. S. K. Mukerjee of the Botanical Survey of India for giving us facilities for our botanical researches at Calcutta. We have to acknowledge much assistance of Sir G. Taylor, Mr. C. E. Hubbard, Mr. J. R. Sealy of the Royal Botanic Garden at Kew, Mr. W. T. Stearn of the British Museum of Natural History at London, and Mr. B. L. Burtt of the Royal Botanic Garden at Edinburgh.

We owe much to the enthusiasm of Mr. Naotomo Sasaki of the National Garden Shinjuku-Gyoen, Mr. Atuhiko Aoyama of the University of Tokyo, Mrs. Fusako Yamazaki and Mr. Motonosuke Ozawa of Tokyo, and Mr. Kunio Sato of Karuizawa who have greatly helped us in cultivating the Himalayan plants for our studies.

Finally we wish to take this opportunity to express our warm thanks to all institutions, banks, companies, and persons that have extended their support, financial and otherwise, to our Botanical Expeditions.

August 1966 Hiroshi Hara

EXPLANATION OF PLATES

Plate 1. Bhandukay Bhanjang, E. Nepal, alt. ca. 3000 m, where a large tree of *Tetracentron sinense* was found for the first time. The snowy mountains on the background are the Kangchenjunga range (alt. up to 8585 m) (Dec. 3, 1963).

Plate 2. a. The *Abies spectabilis* forest.
Diorali Bhanjang, E. Nepal, alt. 3300 m (Nov. 14, 1963).
- b. The evergreen oak forest of *Quercus semecarpifolia* Smith.
Halhale Bhanjang, E. Nepal, alt. 2600 m (Dec. 1, 1963).

Plate 3. a. The temperate deciduous forest, consisting of *Acer*, *Magnolia*, *Corylus*, etc. The undergrowth is *Arundinaria Maling* Gamble. Thakma Khola, E. Nepal, alt. 3000 m (Nov. 12, 1963).
- b. *Paris polyphylla* Smith with a ripe dehiscent capsule.
Below Tinjuray, E. Nepal, alt. 2800 m (Oct. 27, 1963).
- c. *Euonymus frigidus* Wall. bearing fruits.
Above Mul Pokhari, E. Nepal, alt. 2600 m (Oct. 29, 1963).

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Below Minchin Dhap, E. Nepal, alt. 2800 m (Oct. 29, 1963).
- b. *Gentiana speciosa* Marquand. Above Mul Pokhari, E. Nepal, alt. 2600 m (Oct. 29, 1963).
- c. *Tripterospermum volubile* Hara with scarlet berries.
Below Akasay, E. Nepal, alt. 2200 m (Nov. 30, 1963).
- d. *Tripterospermum nigrobaccatum* Hara with black berries.
Above Mul Pokhari, E. Nepal, alt. 2800 m (Oct. 29, 1963).

Plate 5. a. *Loxostigma Griffithii* C. B. Clarke. Below Siling Tzokupa, E. Nepal, alt. 2000 m (Nov. 20, 1963).
- b. *Mitrephora Harai* Ohashi. Tarku between Singtam and Temi, Sikkim, alt. 700 m (Mar. 25, 1963).
- c. *Hydrobryum Griffithii* Tulasne. The brownish plants in the upper part bear ripe fruits. Near Linkhim, E. Nepal, alt. 1800 m (Nov. 4, 1963).
- d. *Rubia Manjith* Roxb. with madder red flowers. Darjeeling, alt. 2150 m (Sep. 15, 1964).

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- b. *Meconopsis napaulensis* DC. Kala Pokhari, alt. 3100 m (Sep. 16, 1964).
- c. *Aconitum spicatum* Stapf. Below Tonglu, alt. 2900 m (Sep. 16, 1964).
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- b. *Pleione humilis* D. Don. Collected from among mosses on the trunk of tree at Tendong Peak, Sikkim, alt. 2700 m (Mar. 26, 1963). Flowered in Tokyo on Mar. 10, 1965.
- c. *Gastrochilus calceolaris* D. Don. Collected from the tree trunk near Ghatte, E. Nepal, alt. 1800 m (Nov. 18, 1963). Flowered in Tokyo on Mar. 10, 1965.

Plate 8. a–c. *Arisaema exappendiculata* Hara. a. Spathe, ×1. b. Spadix with an abnormal short appendix, ×1. c. Stamen, ×10. d & e. *Smilacina fusca* Wall. d. Flower, ×10. e. The same from the back side. f–i. *Paederia foetida* L. f. Fruit, ×5. g. Seed, ×5. h & i. Longitudinal sections of seed. j & k. *Paederia scandens* Merr. var. *Mairei* Hara. j. Fruit, ×5. k. Longitudinal section of seed, ×5. Del. S. Kurosawa.

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Plate 12. a. *Prunus cerasoides* at Taplejung, E. Nepal, alt. 1900 m.
b. *Prunus cerasoides* at Gorzu Kosir, E. Nepal, alt. 2100 m.
c. The thicket of *Arundinaria Maling* above Bakkim, Sikkim, alt. 2900 m.

Plate 13. a. The *Tsuga dumosa* forest near Thakma Khola, E. Nepal, alt. 3000 m.
b. The forest of *Rhododendron Hodgsoni* below Jongri, Sikkim, alt. 3700 m.

Plate 14. a. The alpine meadow with *Juniperus squamata* and *Rhododendron anthopogon* scrub at Jongri, Sikkim, alt. 4000 m.
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Plate 15. a. The *Alnus nepalensis* forest near the village of Mai Majuwa, E. Nepal, alt. 1900 m.
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Plate 16. a. Terraced rice paddies near Khebang, E. Nepal, alt. 1700 m.
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c. The same with spreading spikes, below Taplejung, E. Nepal.

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b. *Salix plectilis* Kimura. Holotypus.

Plate 18. a. *Elatostema reptans* Hook. f. (Sikkim, Herb. Griffith, Kew Distr. no. 4535, Typus in K), ×ca. 3/8. b. *Elatostema reptans* Hook. f. (Chittagong, C. B. Clarke), ×ca. 3/8. c. *Urtica macrostachya* Wall. Wall. no. 4582, Nepalia (= *Boehmeria platyphylla* D. Don), ×ca. 3/8. Scales are all the same as shown in fig. c.

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Plate 21. a–h: Variation in the apical shape of terminal leaflets (a–e, ×5) and in the hairs on a stem (f–h, ×7) of *Amphicarpaea bracteata* subsp. *Edgeworthii*. a: var. *Edgeworthii* (C. Nepal, Godavari); b–e: var. *japonica* (b: Japan, N. Honshu, Aizu; c & d: Japan, S. Honshu, Isl. Mikura-zima; e: Japan, C. Honshu, Musashi, Ome—Hikida). Note a series of intermediate shapes between acute and obtuse apex. f–h: var. *japonica* (Japan, C. Honshu, Musashi, Katayama). Note both adpressed and spreading hairs on different parts of the stem of the same individual.

w–z: *Zornia gibbosa* and var. *cantoniensis*. w: *Z. gibbosa* (Merrill no. 3787). A part of glabrous bracts and two articles with numerous retrorsely hairy bristles, ×8. x: *Z. gibbosa* (E. Nepal, Tuwa–Taplethok). A part of articles showing nearly glabrous bristles and prominent reticulations, ×20. y: Same of x illustrating ciliate bract and prominent reticulations of articles, ×6. z: *Z. gibbosa* var. *cantoniensis* (Japan, Tosa). A part of loment showing two villous articles, ×8.

Plate 22. *Liparis Togashii* Tuyama. Holotypus (Hati Sar–Minchin Dhap, E. Nepal, Oct. 28, 1963) ×ca. 2.3. Photo by S. Kurosawa.

Plate 23. *Arisaema exappendiculata* Hara.
- a. A male spadix with an opened spathe, ×1.5.
- b. A male spadix, ×5.

Plate 24. Photomicrographs of somatic chromosomes.
- a, b. *Trillium Govanianum*, ×ca. 900. (Photo by H. Watanabe)
- c, d. *Acorus Calamus*. c. Akasay, E. Nepal, d. Taplejung, E. Nepal. (Photo by S. Kawano)

Plate 25. *Pteris nepalensis* H. Ito. Holotypus.

Plate 26. *Dryopteris Harae* H. Ito. Holotypus.

Plate 27. *Inonotus xeranticus* (Berk.) Imazeki et Aoshima (HF 61).
a. Upper surface of the pileus, ×3/4. b. Pore surface, ×3/4. c. Vertical section through the pileus, showing the bright yellow colored thin context which is interposed between thick superficial tomentose layer and hymenophore, ×5/2. d. Vertical section through the pileus of Japanese specimen, ×5/2. e. Photomicrograph of the vertical section through the pileus. a. superficial tomentose hairs; b. subcrust; c. context; d. hymenophore.

Plate 28. *Pyrrhoderma adamantinum* (Berk.) Imazeki (HF 83). a. The type specimen of *Polyporus adamantinus* Berk., in Herb. Kew, ×1/2. b. The specimens collected by the present expedition, upper and under surfaces, ×1/2. c. The same, the under surface, ×1/2. d. Vertical section of the pileus, showing the crust, narrow black interrupted streaks and white mycelial strands in the context, ×5/3. e. Photomicrograph of vertical section of the crust, showing its palisadodermous structure.

Plate 29.
- a. *Peracarpa carnosa* var. *circaeoides* Makino. Kamakura, C. Honshu, Japan.
- b. *Peracarpa carnosa* Hook. f. et Thoms. Penlong La, Sikkim.
- c. *Peracarpa carnosa* var. *circaeoides* Makino. Oze, C. Honshu, Japan.
- d. *Ellisiophyllum pinnatum* Makino var. *reptans* Yamazaki. Tokyo, cult.
- e. *Ellisiophyllum pinnatum* Makino. Bhuspate Danra, E. Nepal.

Plate 30. Photomicrographs of pollen grains.
a, a′. *Koenigia delicatula*. b, b′. *Aconogonum molle* var. *frondosum*. c, c′. *Aconogonum campanulatum*. d, d′. *A. campanulatum* var. *fulvidum*. e. *Persicaria microcephala*. f. *Persicaria polystachya*. g. *Persicaria nepalensis*. (Photo by M. Ikuse).

Plate 31. Seedlings of the *Rubia cordifolia* group.
- a. *Rubia Manjith* Roxb. Namchi, Sikkim.
- b. *Rubia Wallichiana* Decaisne. Bilbatay Bhanjang–Hati Sar, E. Nepal (Oct. 27, 1963).
- c. *Rubia Akane* Nakai. Karuizawa, C. Honshu, Japan (Nov. 18, 1964).

d. 1. *Rubia Akane* Nakai. Nokogiriyama, Okutama, C. Honshu, Japan.
2. *Rubia cordifolia* L. Nagasaki, Kyushu, Japan.
3. *Rubia Manjith* Roxb. Namchi, Sikkim.

Plate 32. Photomicrographs of chromosomes.
a. *Chrysosplenium nepalense*, × 1500, Tiger Hill, Darjeeling.
b. *Chrysosplenium Grayanum*, × 1500.
c. *Anemone vitifolia*, × 1500, Batasi, E. Nepal.
d. *Chrysosplenium lanuginosum*, somatic chromosomes, × 1800, Bhuspate Danra, E. Nepal.
e. The same, gametic chromosomes, × 1800.
f. *Dichroa febrifuga*, × 1500, Darjeeling.

Plate 33. Photomicrographs of chromosomes.
a. *Boenninghausenia albiflora* var. *japonica*, × 1500, Mt. Takao, near Tokyo.
b. *Boenninghausenia albiflora*, × 1500, Darjeeling.
c. *Geranium nepalense*, × 1500, Darjeeling.
d. *Stachyurus praecox*, × 2000, Akita, N. Honshu.
e. *Stachyurus himalaicus*, × 2000, Minchin Dhap–Mul Pokhari, E. Nepal.
f. *Phryma Leptostachya*, from Karuizawa, C. Honshu, × 1500.
g. The same from Godavari, E. Nepal, × 1500.
h. *Helwingia himalaica*, × 1500, Above Ghum, Darjeeling.
i. *Helwingia japonica*, × 1500, Mt. Takao, near Tokyo.

Plate 34. Photomicrographs of chromosomes.
a. *Lysimachia congestiflora*, × 1500, Penlong La, Gangtok.
b. *Lysimachia debilis*, × 1500, Baroya Khimty, E. Nepal.
c. *Lysimachia ferruginea*, × 1500, Tharpu, E. Nepal.
d. *Lysimachia ferruginea*, × 1500, Pouwa, Kathmandu, E. Nepal.
e. *Lysimachia ferruginea*, × 1500, Temi, Sikkim.
f. *Lysimachia japonica*, × 1500, Tôsenzan, Kyushu.
g. *Lysimachia Tashiroi*, × 1500, Hitoyoshi, Higo, Kyushu.

Plate 35. Photomicrographs of chromosomes.
a. *Rubia cordifolia*, × 1500, Nagasaki, Kyushu.
b. *Rubia Akane*, × 1500, Karuizawa, C. Honshu.
c. *Rubia Wallichiana*, × 1500, Rabong La, Sikkim.
d. *Rubia Manjith*, × 1500, Namchi, Sikkim.
e. *Rubia sikkimensis*, × 1500, below Yektin, E. Nepal.
f. *Rubia Wallichiana*, × 1500, Senchal, Darjeeling.

Plate 36. Photomicrographs of chromosomes.
a. *Ellisiophyllum pinnatum*, × 1500, Bhuspate Danra, E. Nepal.
b. *Ellisiophyllum pinnatum* var. *reptans*, × 1500, Tokyo cult.
c. *Valeriana Hardwickii*, × 2000, Baroya Khimty, E. Nepal.
d. *Viburnum coriaceum*, × 1500, Ghatte–Khebang, E. Nepal.
e. *Viburnum Mullaha*, × 1500, Bhuspate Danra, E. Nepal.
f. *Viburnum erubescens*, × 1500, Mai Majuwa–Mai Pokhari, E. Nepal.
g. *Sambucus adnatus*, × 1200, Bhuspate Danra, E. Nepal.
h. *Sambucus Hookeri*, × 1200, Ghatte–Khebang, E. Nepal.
i. *Peracarpa carnosa* var. *circaeoides*, × 1200, Mt. Iwaki, N. Honshu.
j. *Peracarpa carnosa*, × 1200, Birch Hill, Darjeeling.

Plate 37. Photomicrographs of chromosomes.
  a. *Arisaema speciosum*, × 1500, Penlong La, Sikkim.
  b. *Arisaema exappendiculatum*, × 1500, E. Nepal.
  c. *Aletris sikkimensis*, × 1500, Diorali Bhanjang, E. Nepal.
  d. *Belamcanda chinensis*, × 1500, Godavari, C. Nepal.
  e. *Chlorophytum arundinaceum*, × 1200, Dhankuta, E. Nepal.
  f. *Chlorophytum nepalense*, × 1200, Halhale Bhanjang, E. Nepal.
Plate 38. Photomicrographs of chromosomes.
  a. *Cardiocrinum giganteum*, × 1200, Darjeeling.
  b. *Disporum cantoniense*, × 1200, cult. in Japan.
  c. *Disporum cantoniense var. parviflorum*, $2n=30$, × 1200, Darjeeling.
  d. The same, $2n=14$ × 1200, Garhi Danra, E. Nepal.
Plate 39. Photomicrographs of chromosomes.
  a. *Paris polyphylla*, $2n=20$, × 1200, Senchal, Darjeeling.
  b. The same, $2n=10+1$ B, × 1200, Royal Botanic Garden, Edingburgh.
  c. *Smilacina purpurea*, × 1200, Sandakphu, Singalila Range.
  d. *Smilacina fusca*, × 950, Darjeeling.
Plate 40. Photomicrographs of chromosomes.
  a. *Polygonatum punctatum*, × 1400, Bhandukay Bhanjang–Mai Majuwa, E. Nepal.
  b. The same, × 1400, Tendong Peak, Sikkim.
  c. *Polygonatum oppositifolium*, × 1400, Lloyd Botanic Garden, Darjeeling.
  d. The same, × 1400, Chitray, E. Nepal.
  e. *Polygonatum verticillatum*, × 1400, Sandakphu, Singalila Range.
  f. *Polygonatum cirrhifolium*, × 1400, Bhuspate Danra, E. Nepal.

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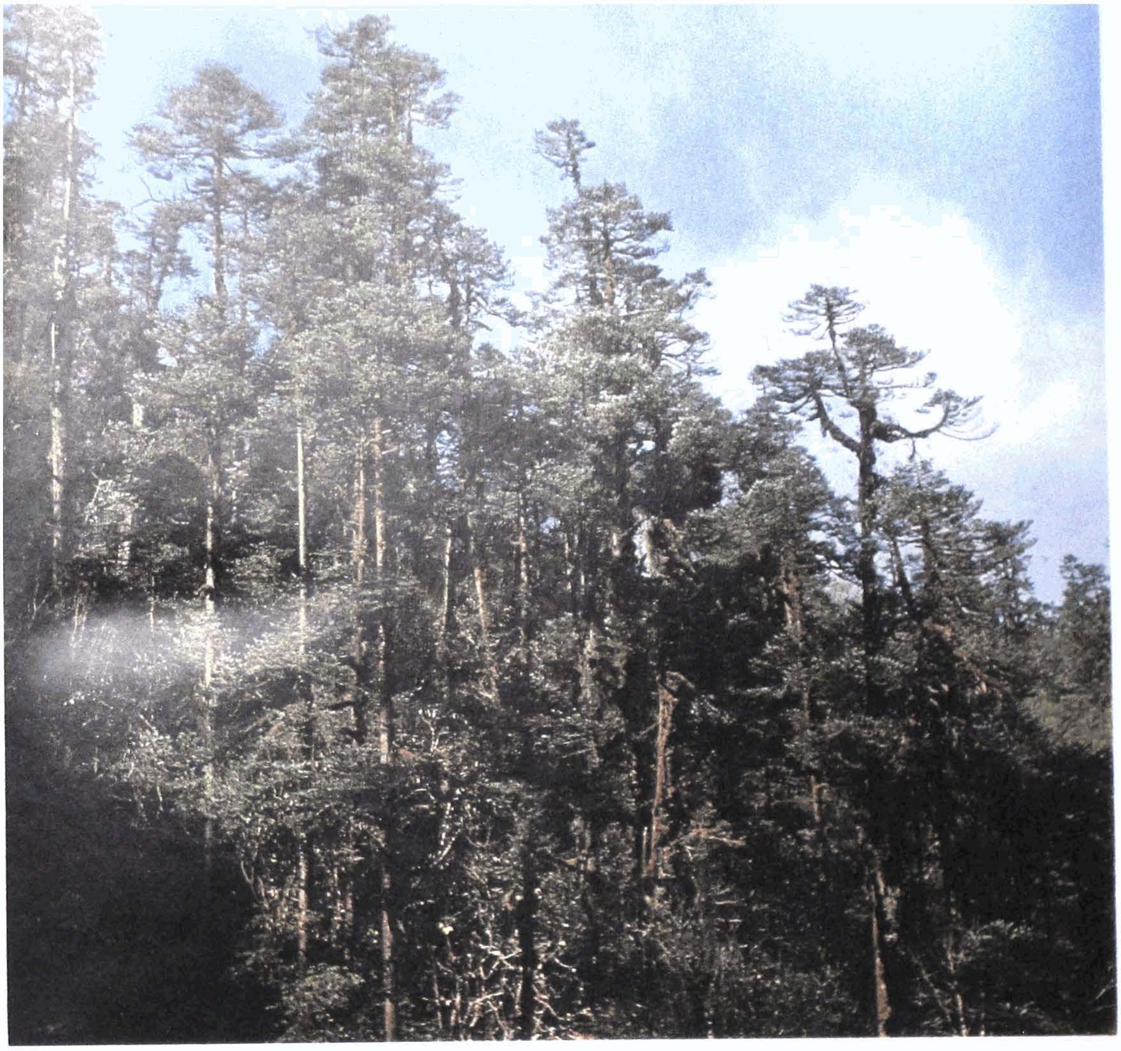
Route Map

Plate



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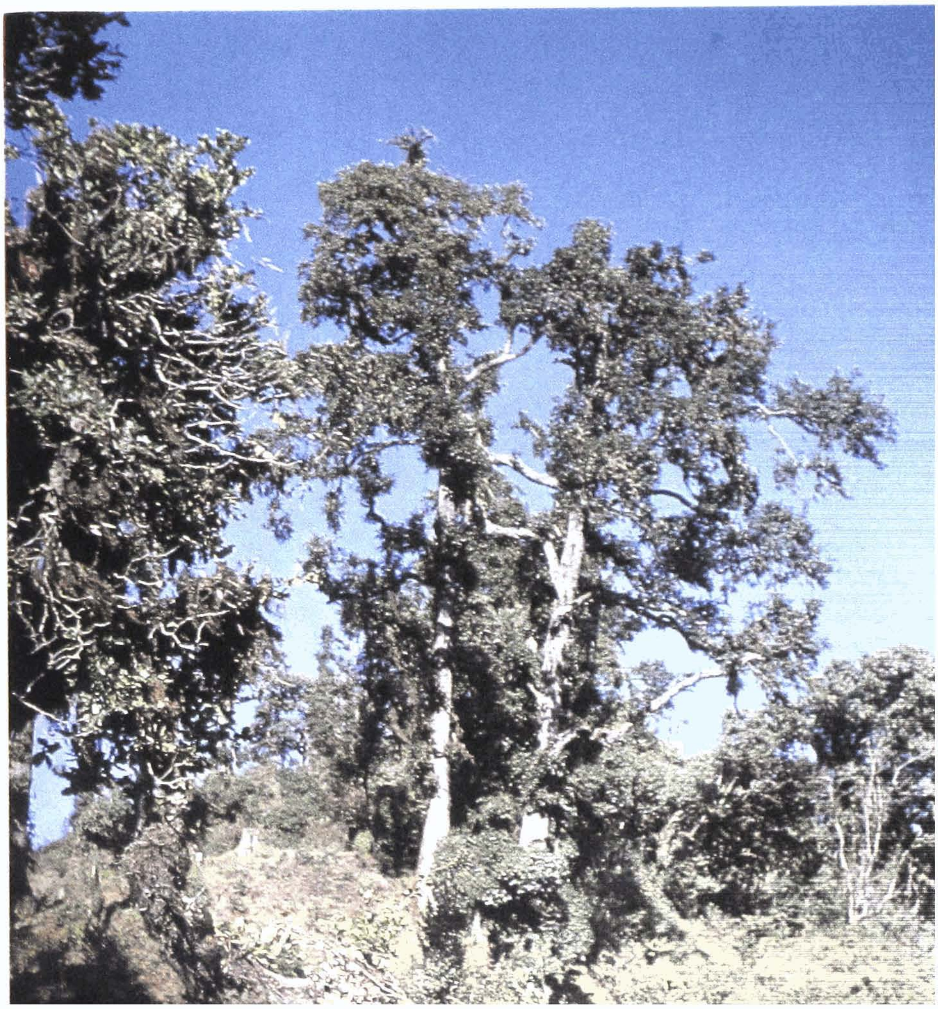
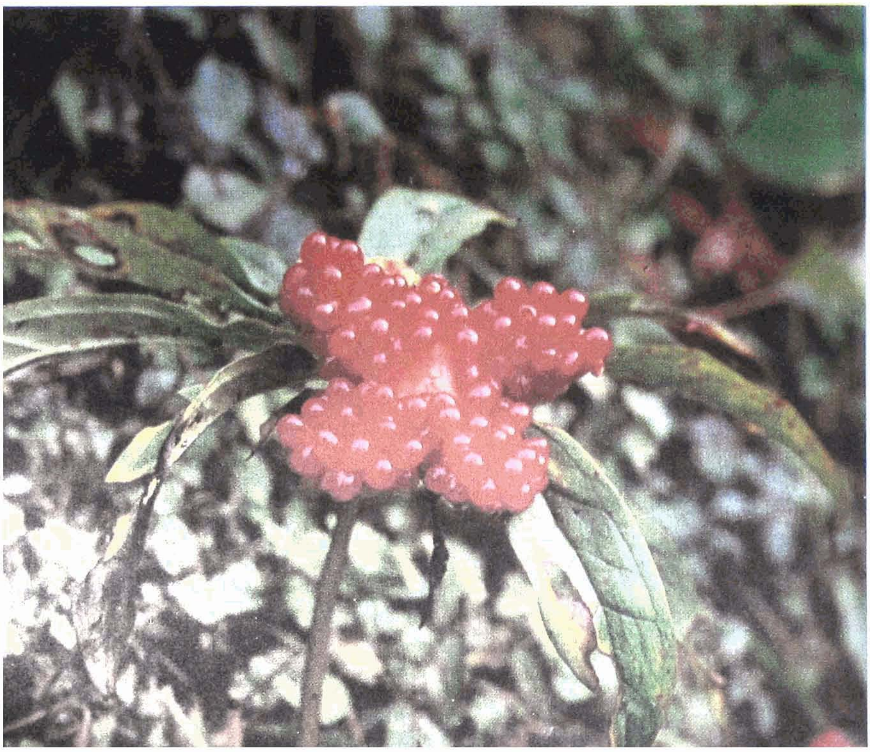


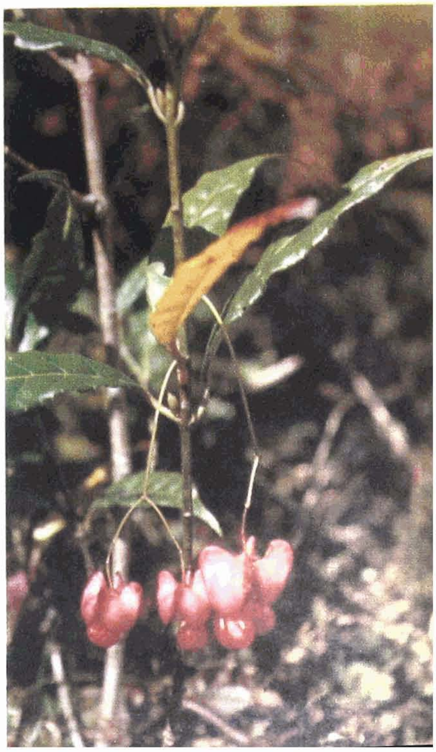
b. The Quercus
semecarpifolia forest

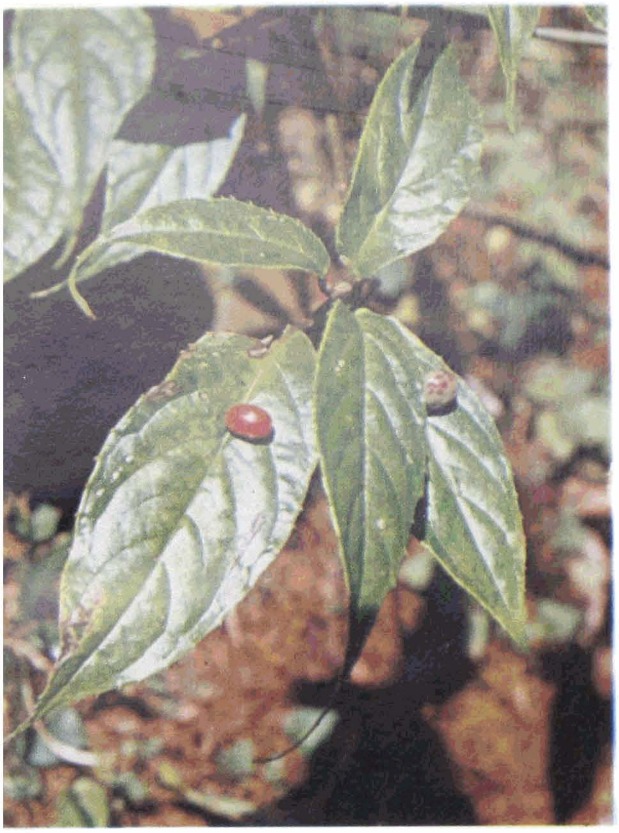
a. The temperate deciduous forest

b. Paris polyphylla



c. Euonymus frigidus





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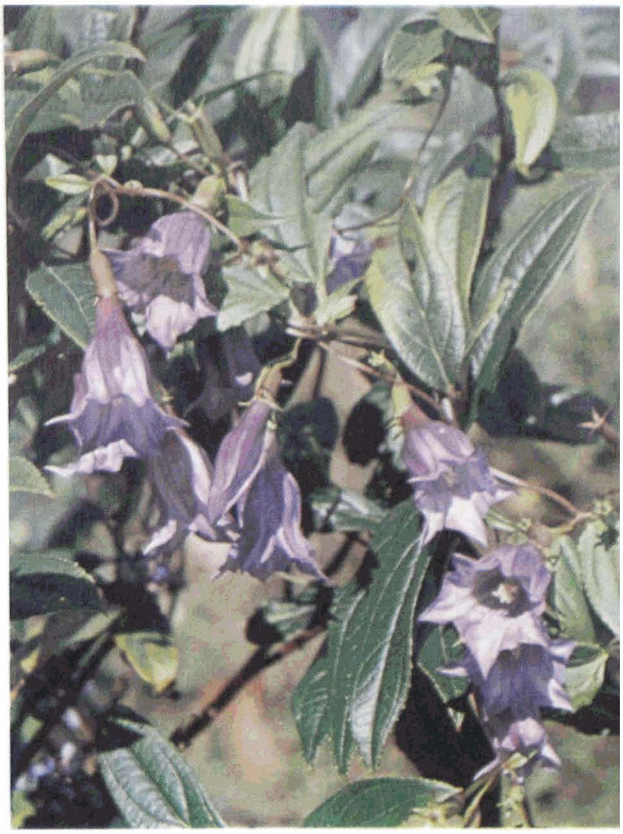

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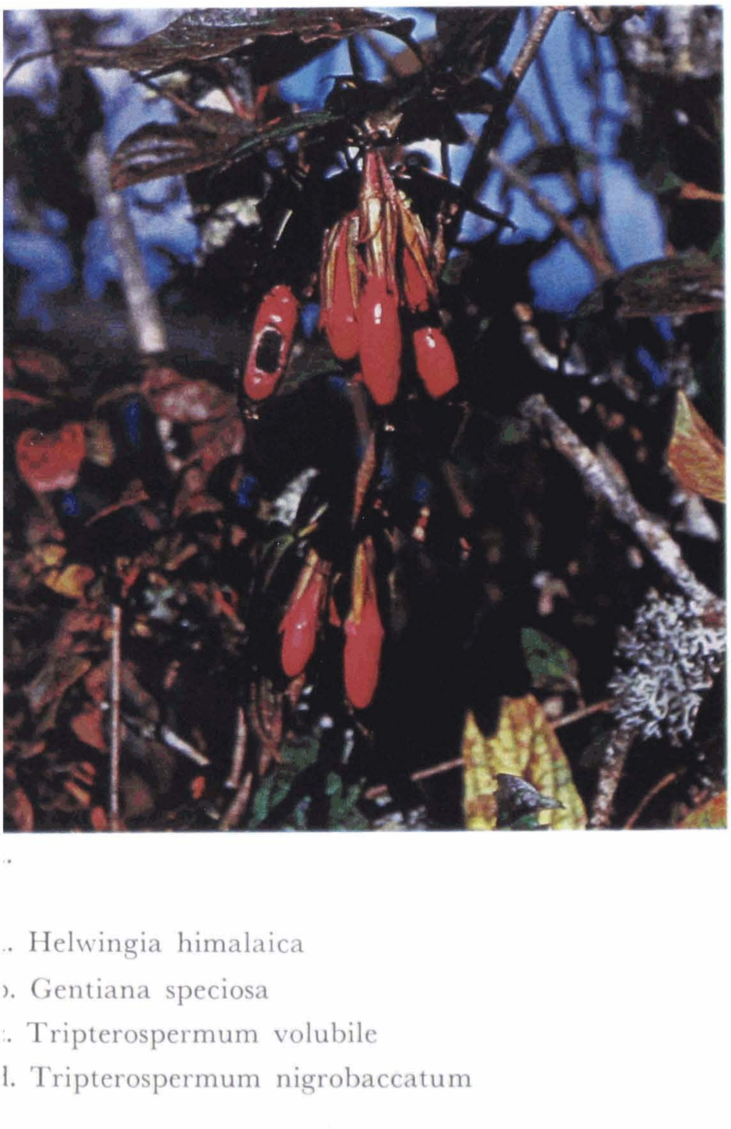

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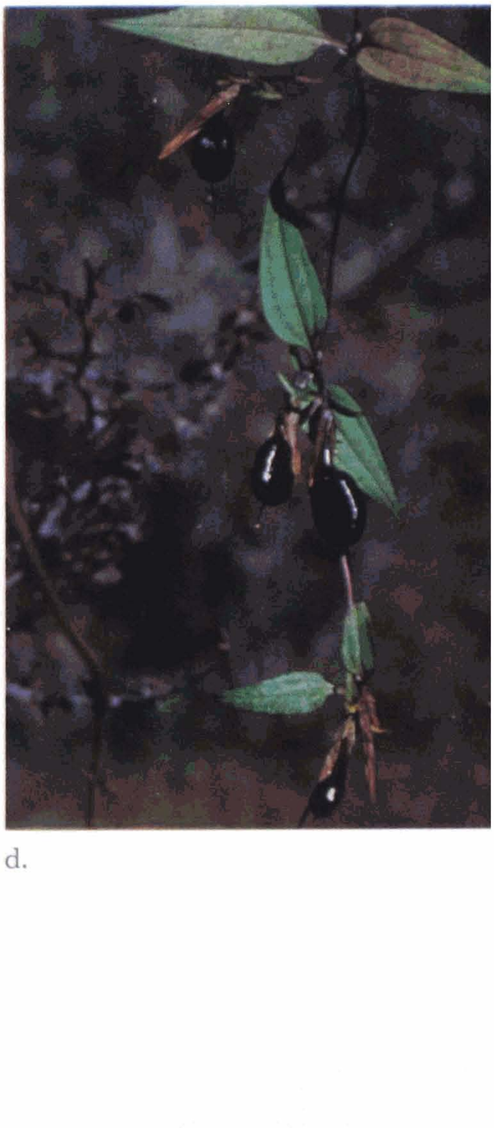
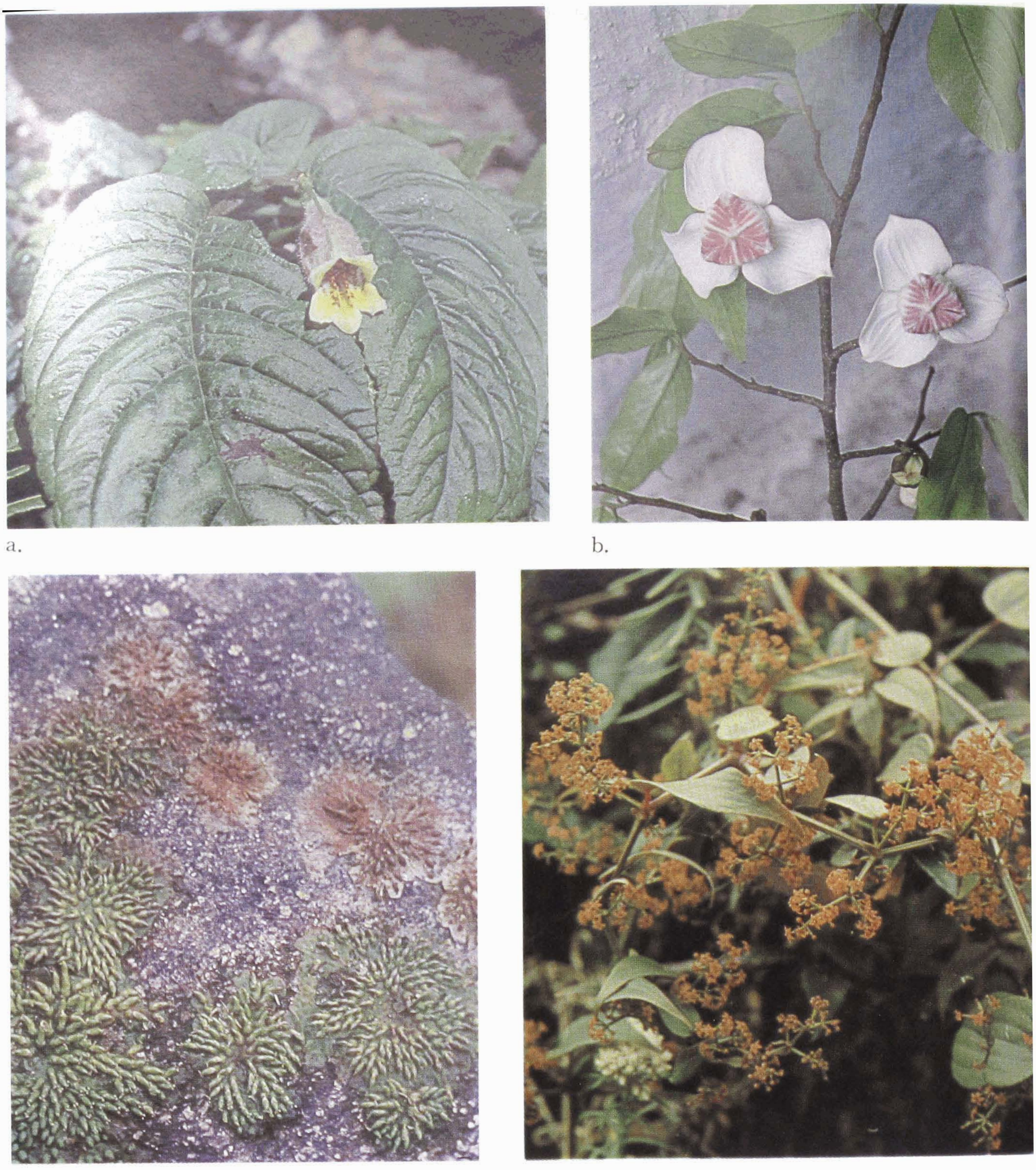


d.

.. Helwingia himalaica
). Gentiana speciosa
:. Tripterospermum volubile
l. Tripterospermum nigrobaccatum

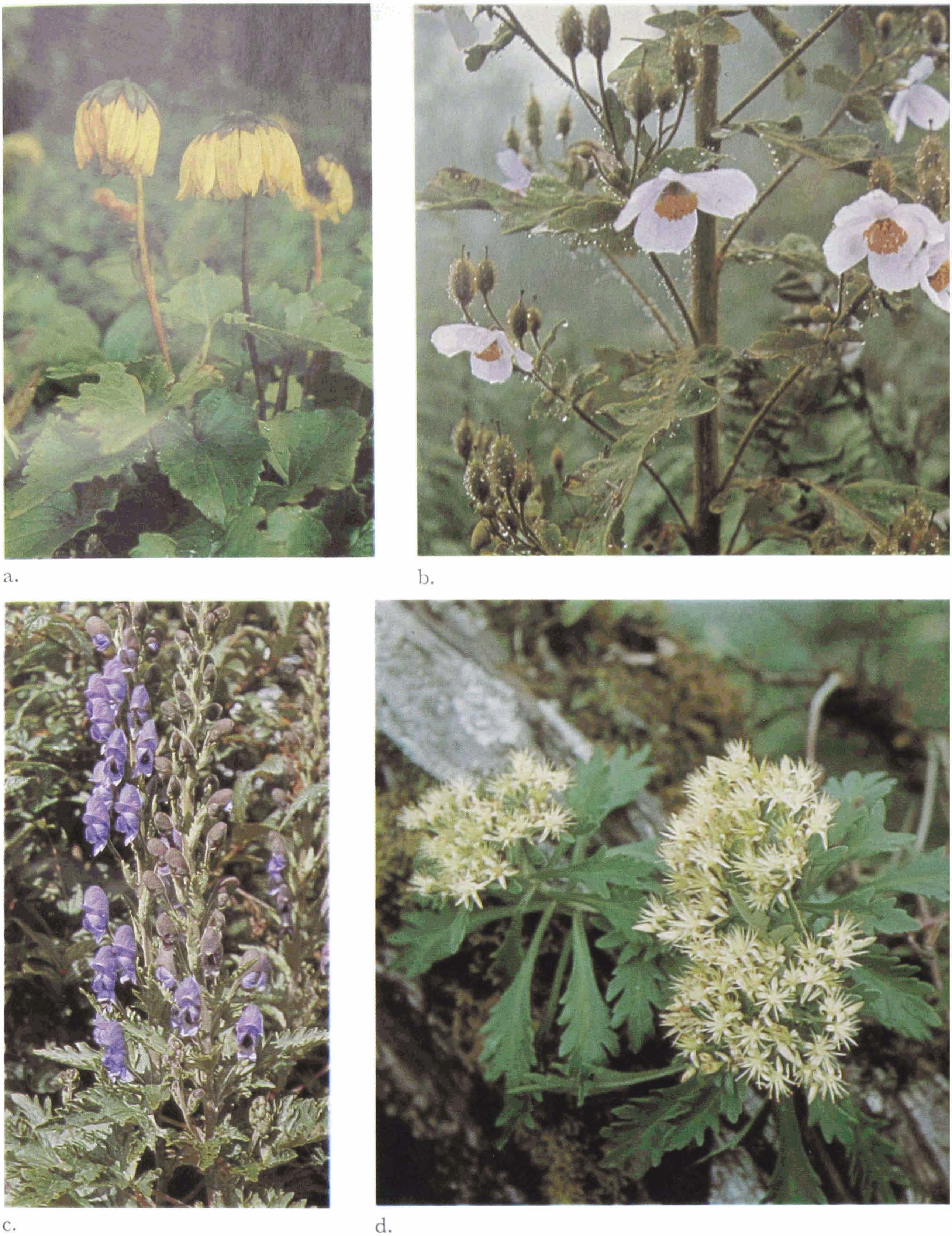
late 4.



a. b. c. d.

a. Loxostigma Griffithii
b. Mitrephora Harai
c. Hydrobryum Griffithii
d. Rubia Manjith

Plate 5.



a.

b.

c.

d.

a. Cremanthodium reniforme

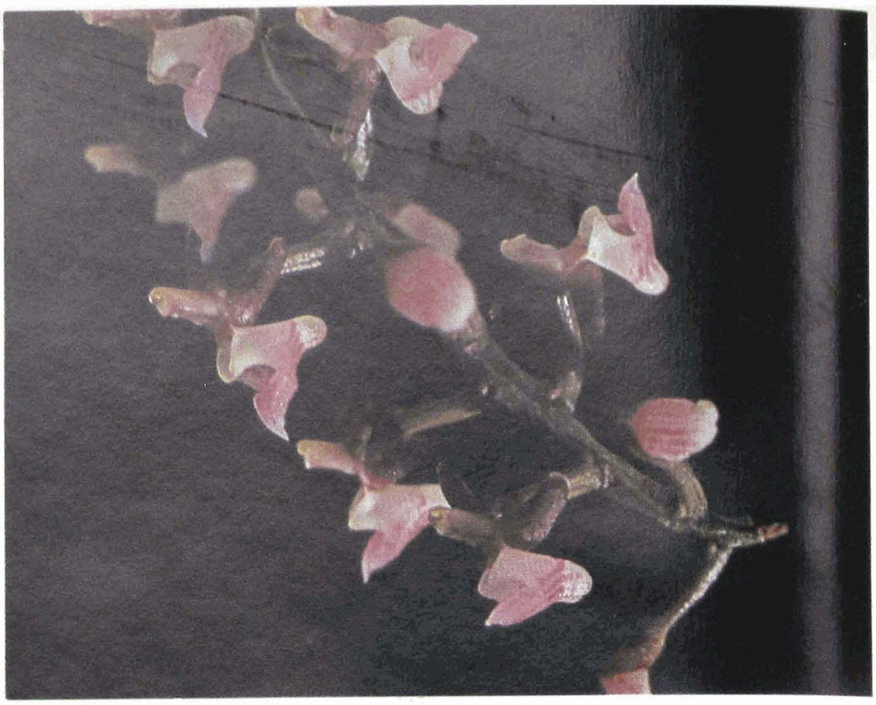
b. Meconopsis napaulensis

c. Aconitum spicatum

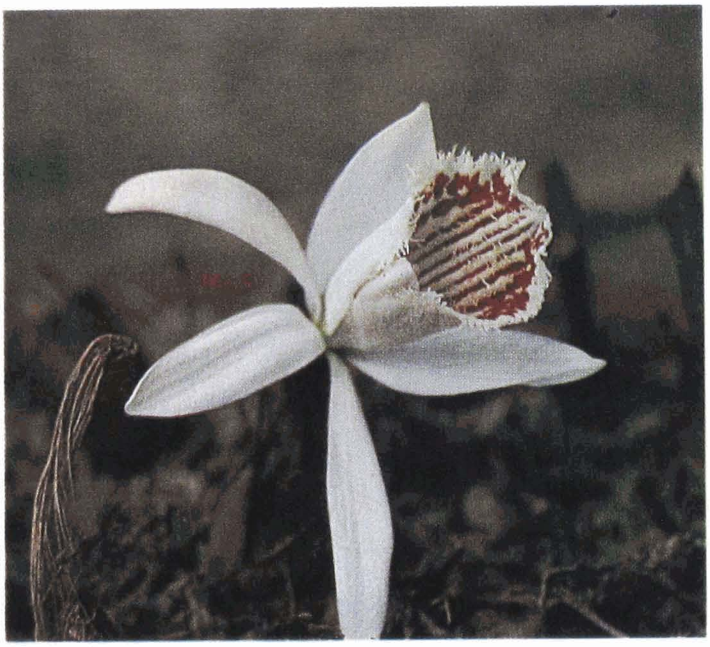
d. Sedum linearifolium var. ovatisepalum

Plate 6.

a. Sarcanthus filiformis



b. Pleione humilis



c. Gastrochilus calceolaris

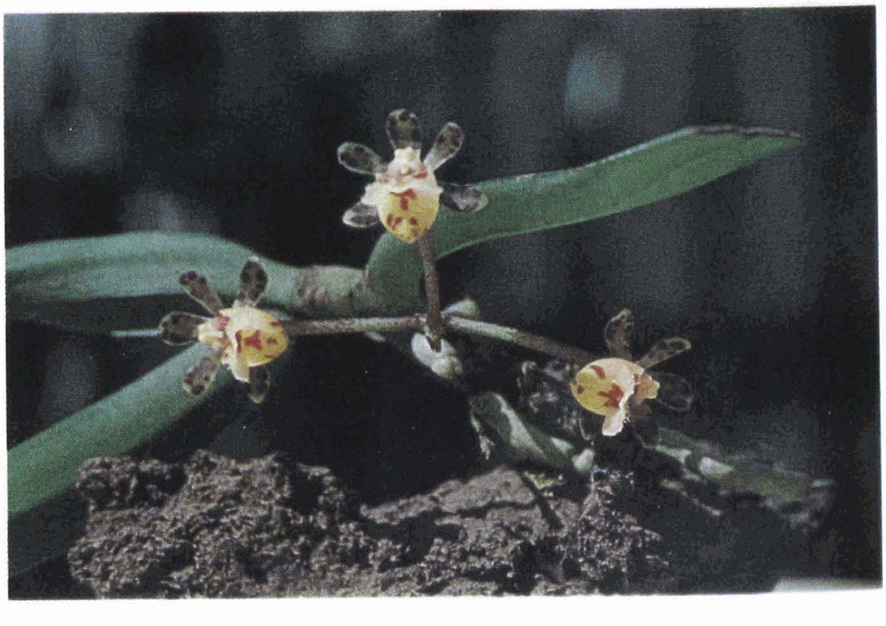


Plate 7.

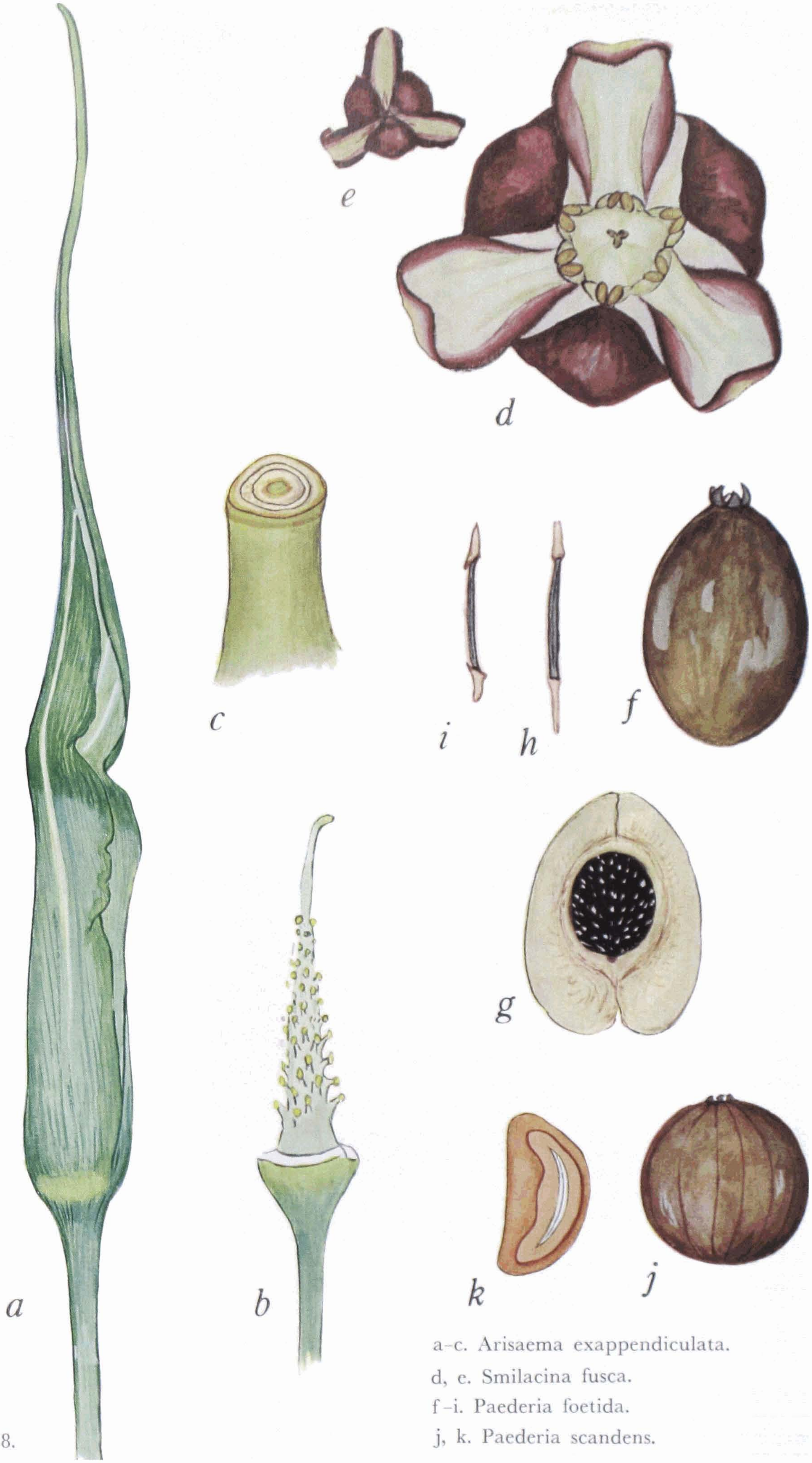


Plate 8.

a–c. Arisaema exappendiculata.
d, e. Smilacina fusca.
f–i. Paederia foetida.
j, k. Paederia scandens.

Plate 9. a. The Tista valley

b. *Zizyphus mauritiana*

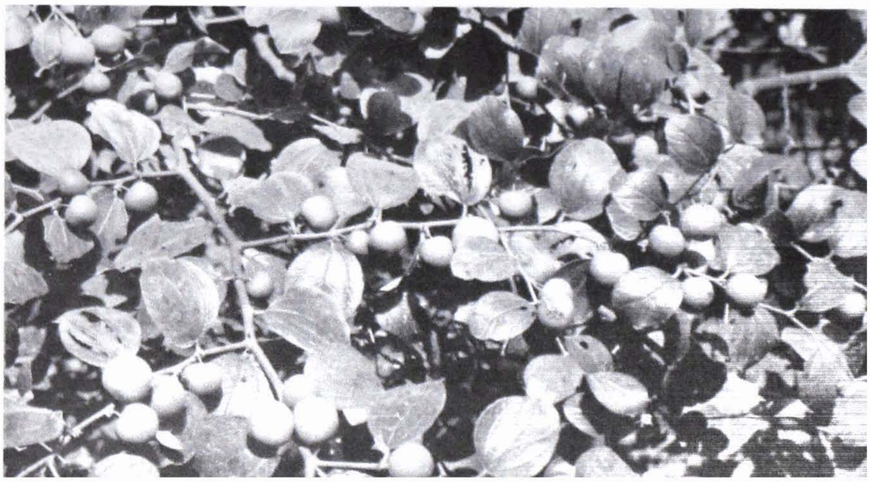


Plate 10. The evergreen oak forest

b. *Castanopsis tribuloides*

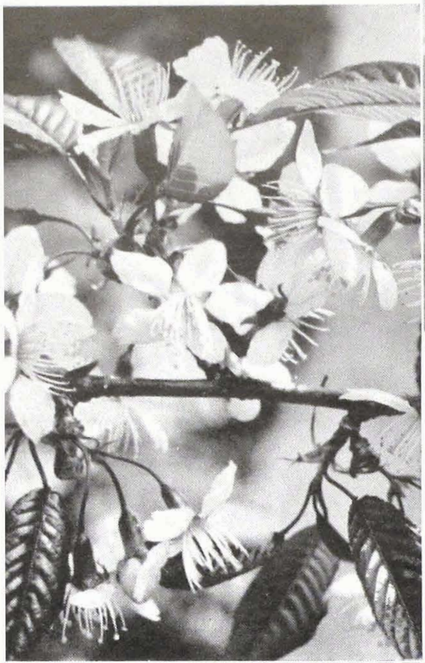
c. *Quercus pachyphylla*

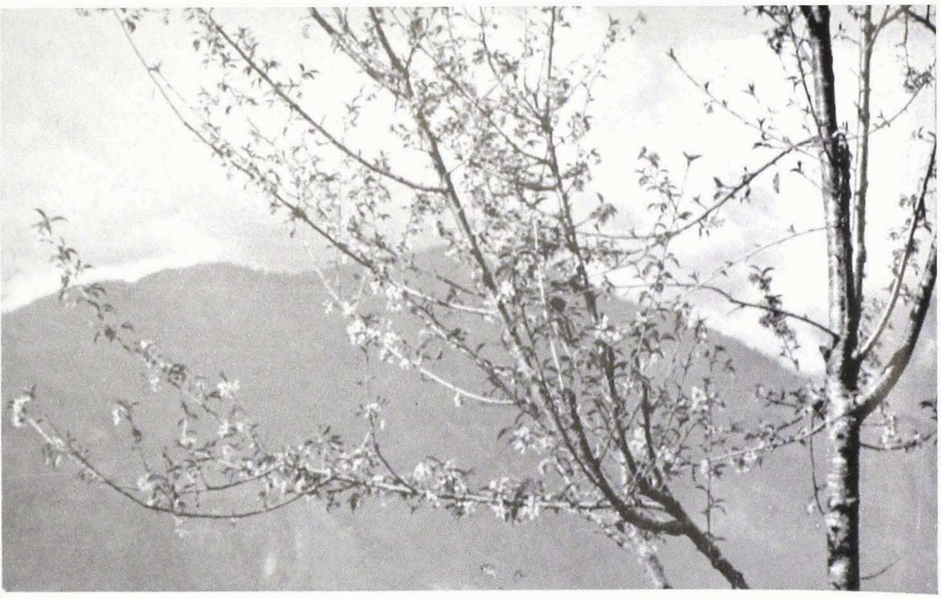
Plate 11. a. The *Berberis* scrub

b. The mountain meadow of *Anaphalis*

Plate 12.

b. *Prunus cerasoides*





a. *Prunus cerasoides*

c. *Arundinaria Maling*

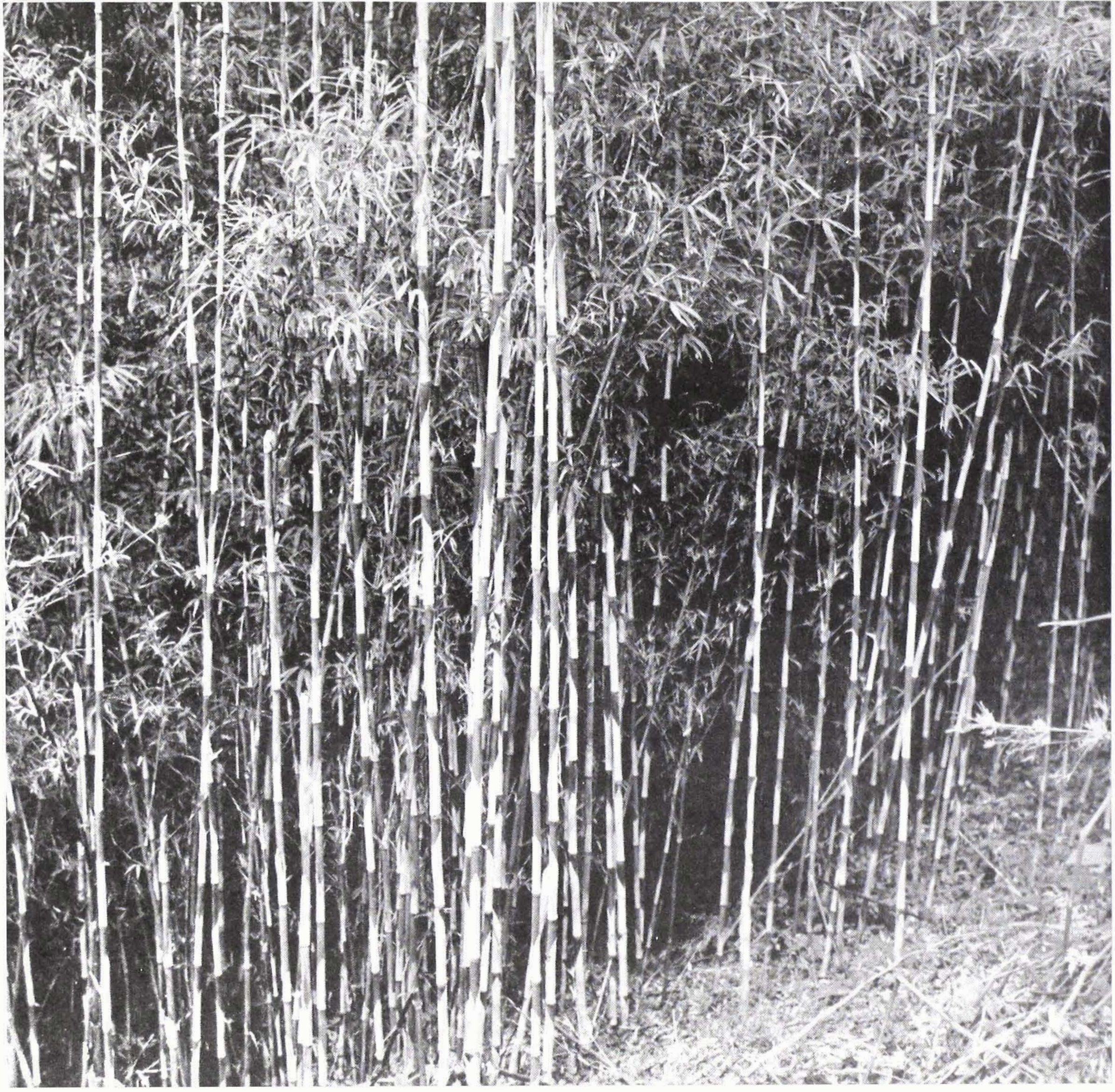
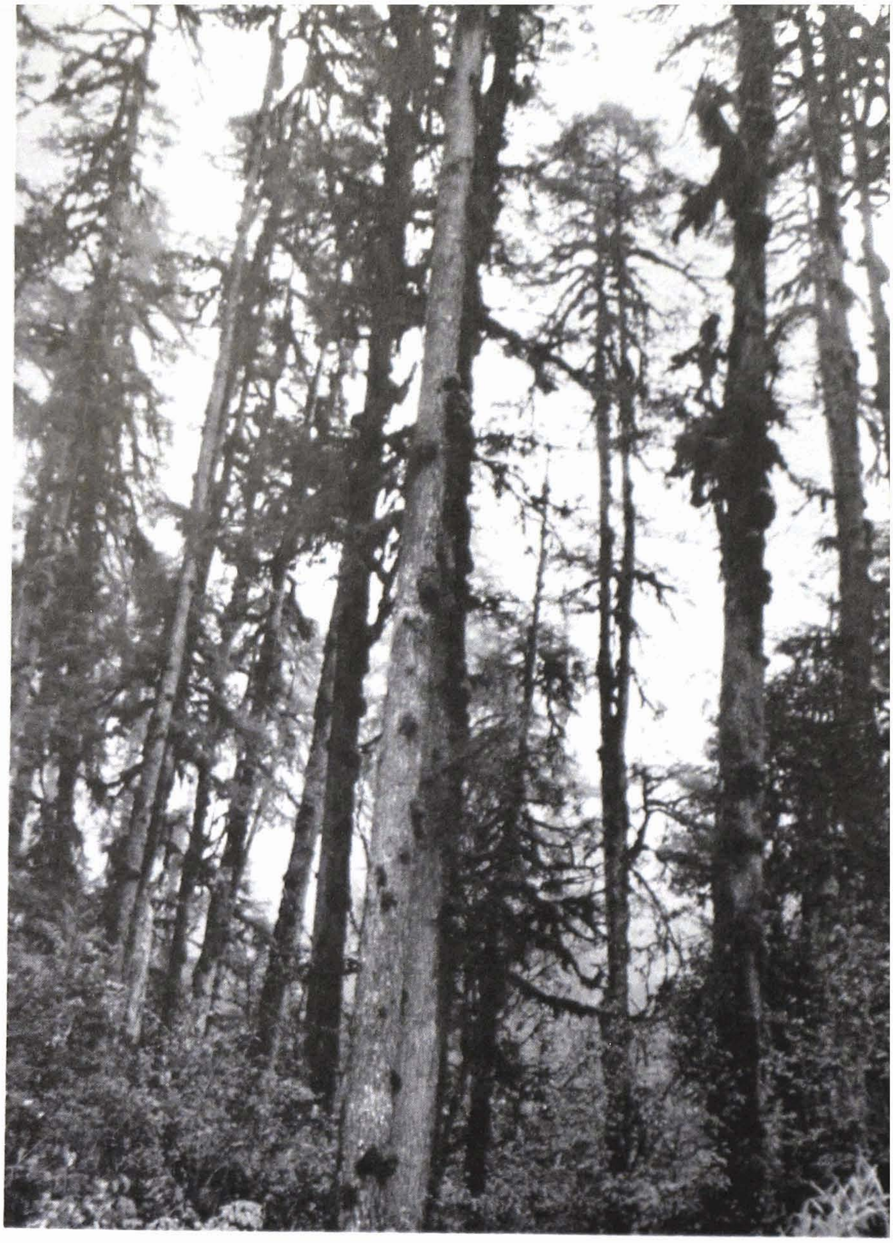
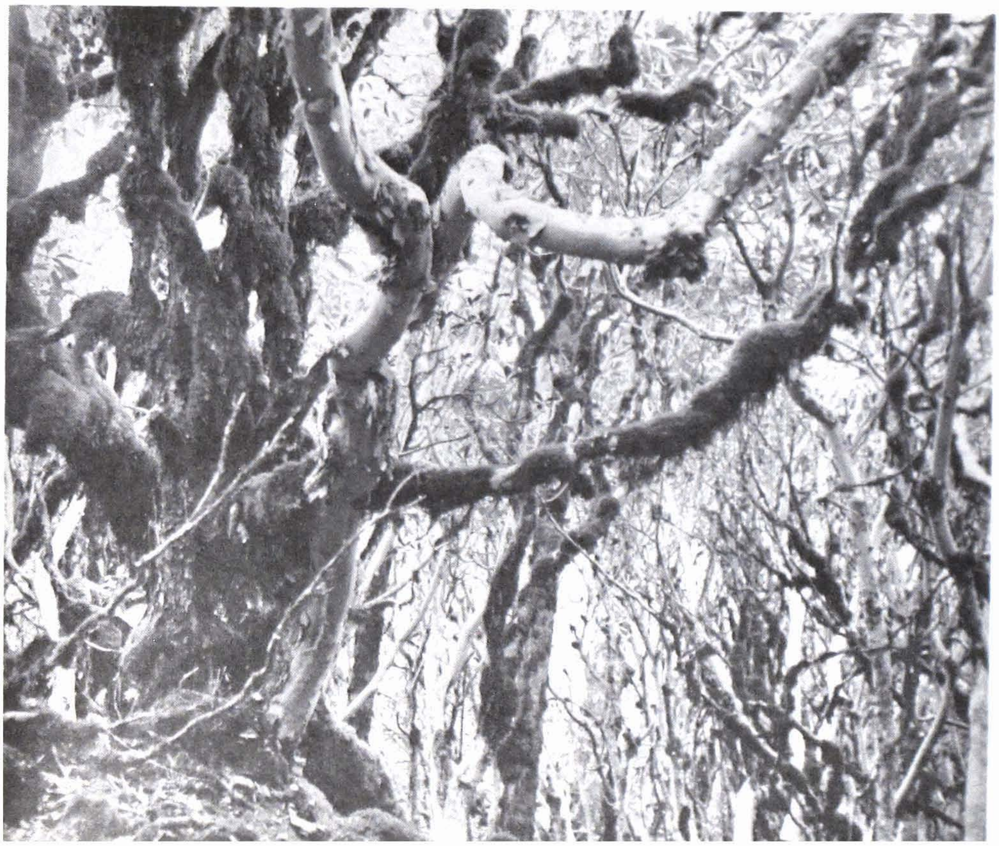


Plate 13. a. The *Tsuga dumosa* forest





b. The forest of *Rhododendron Hodgson*

Plate 14. a. The alpine meadow

b. The grassy slope

Plate 15. a. *Alnus nepalensis* forest

b. *Edgeworthia Gardneri*

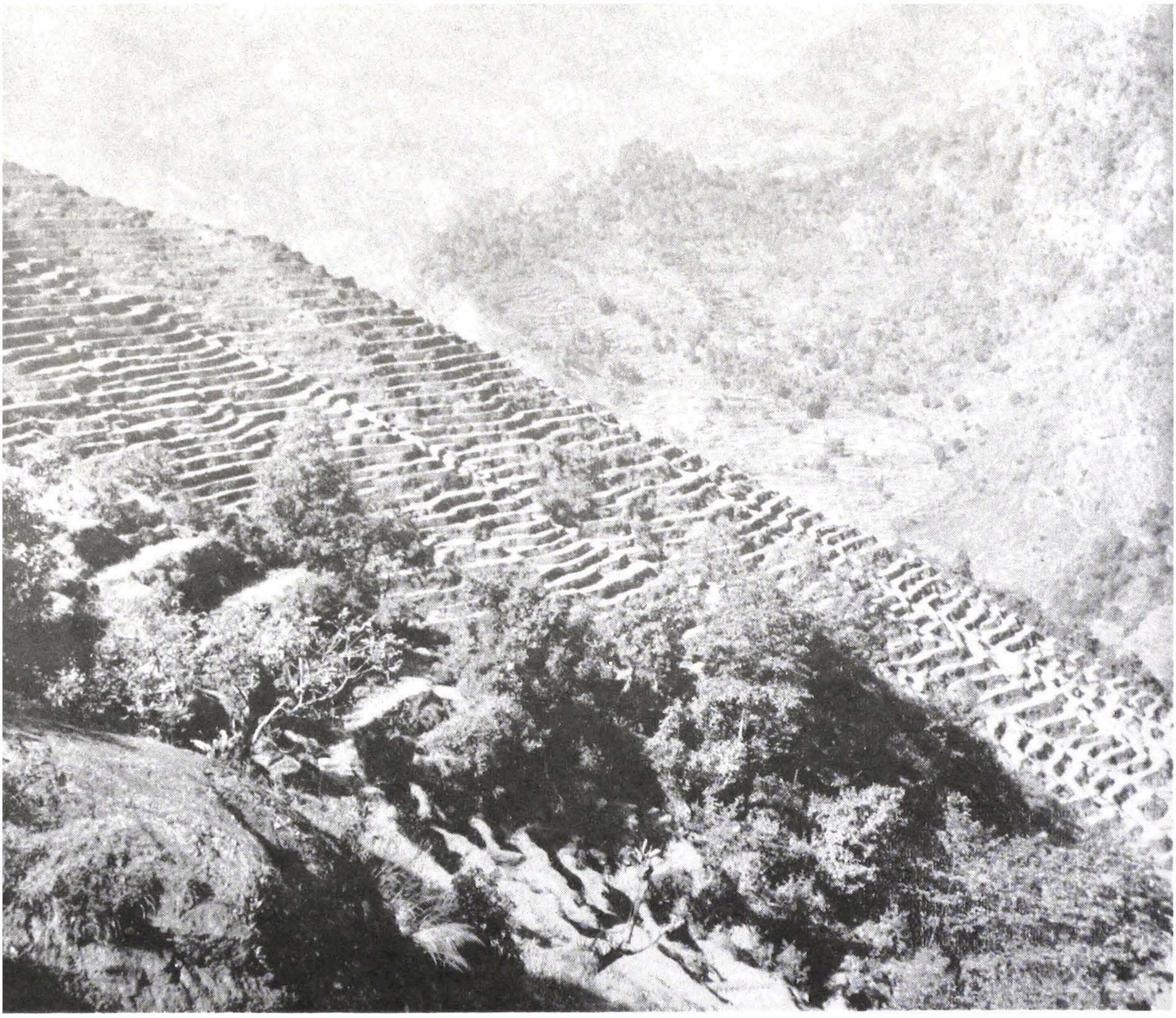
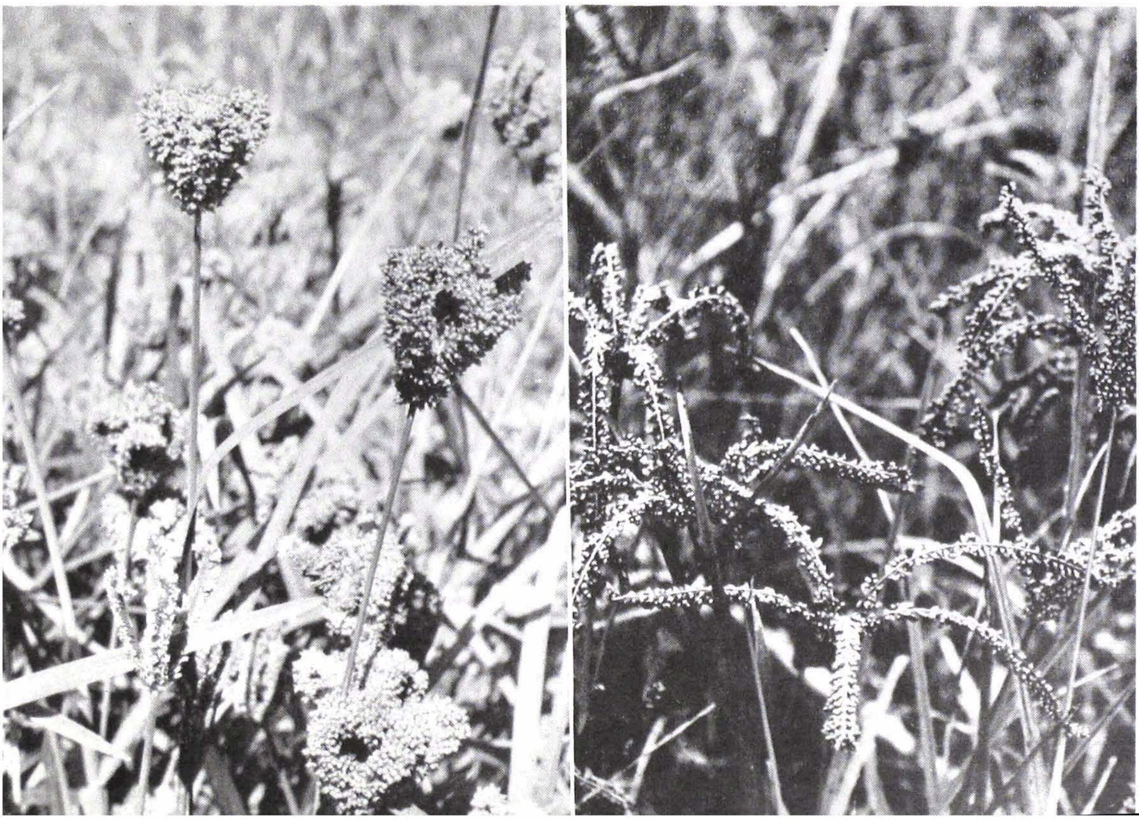


Plate 16. a. Terraced rice paddies

b, c. *Eleusine coracana*



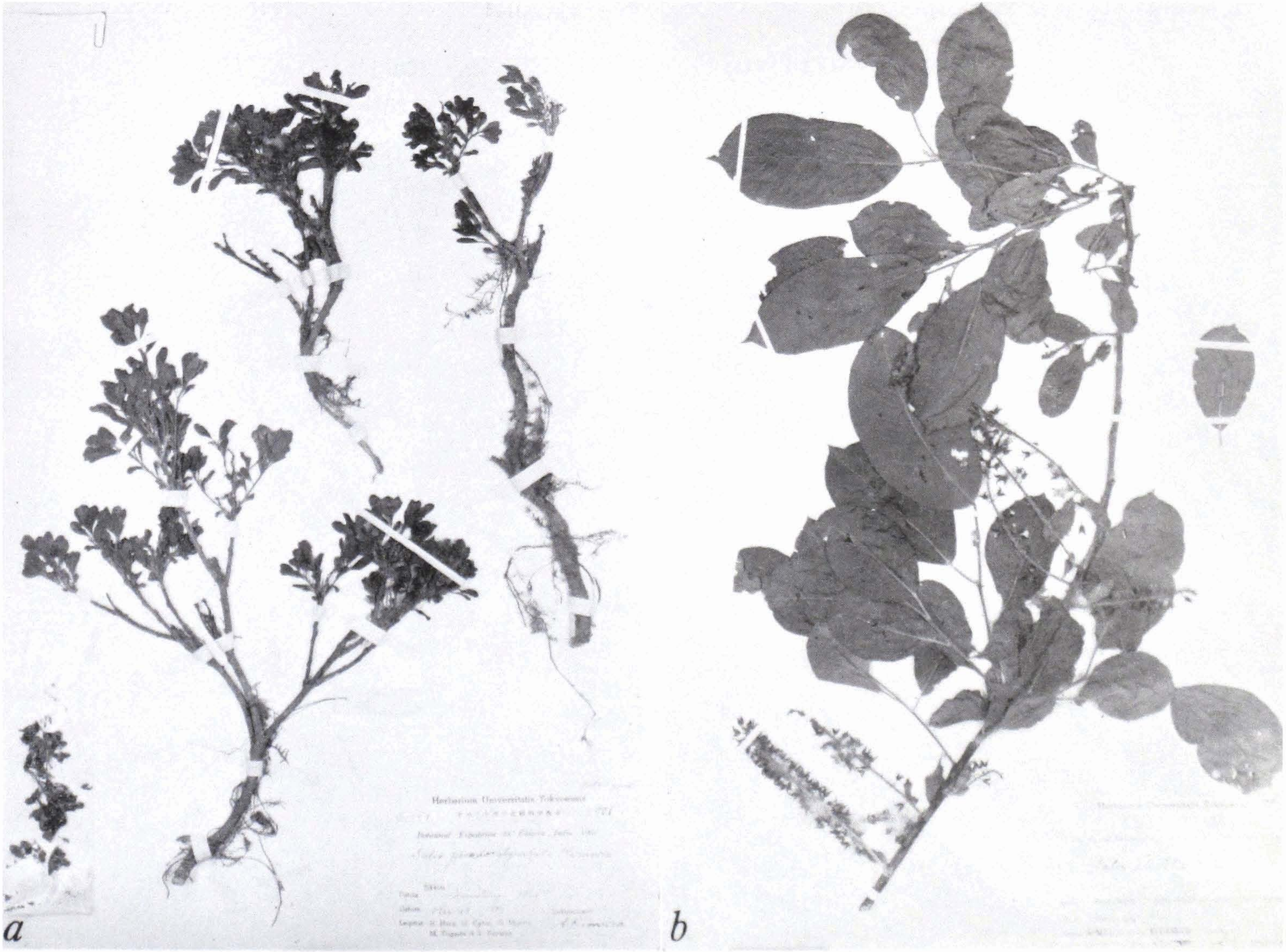
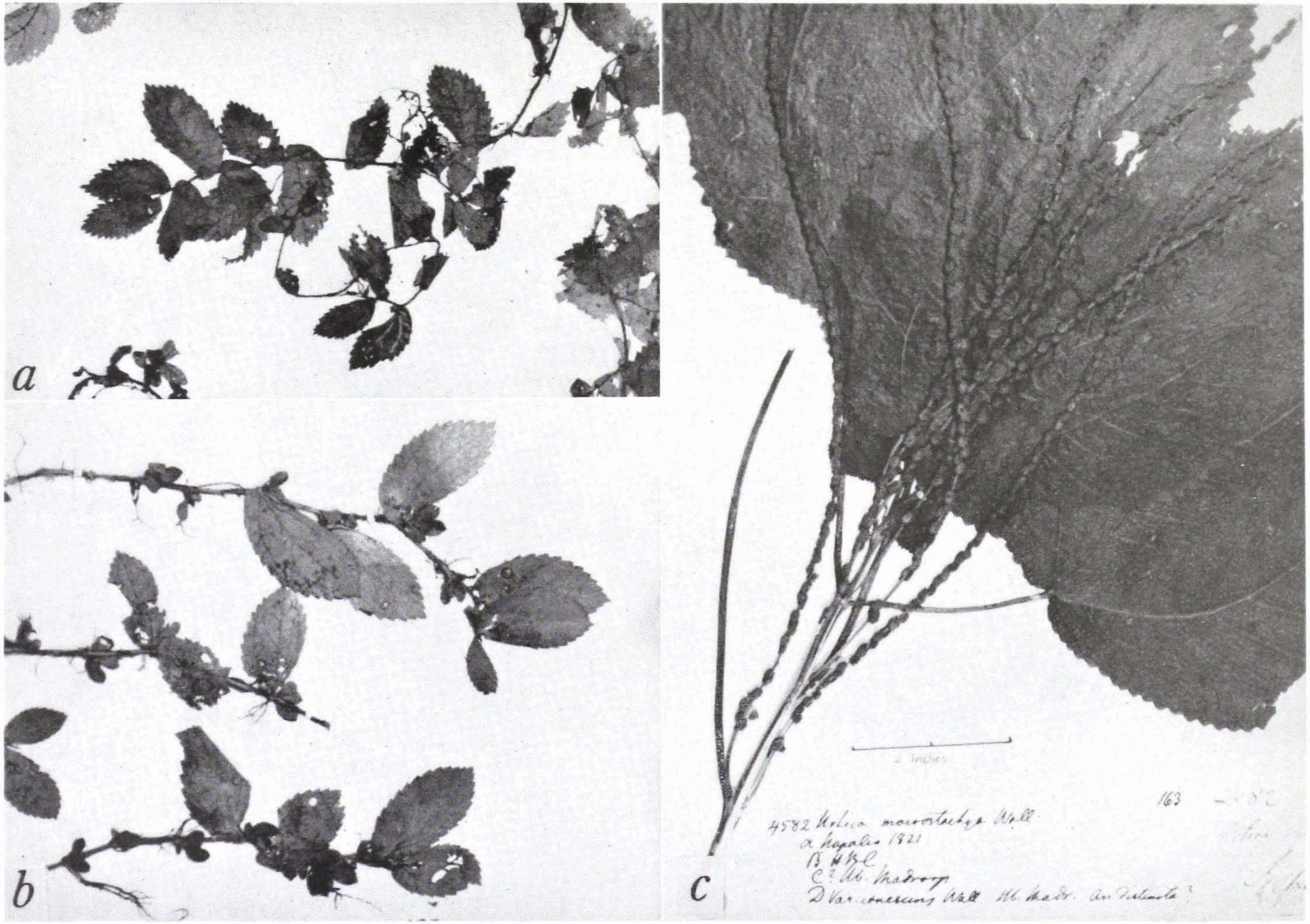


Plate 17. a. *Salix pseudocalyculata* Kimura b. *Salix plectilis* Kimura



a
b
c
2 inches
163
4582 Urtica macrostachya Wall
α Napalia 1821
β H.B.C
C? Hb. Madras
D Var. canescens Wall Hb. Madr. An distincta?

Plate 18. a, b. *Elatostema reptans* Hook. f. c. *Urtica macrostachya* Wall.

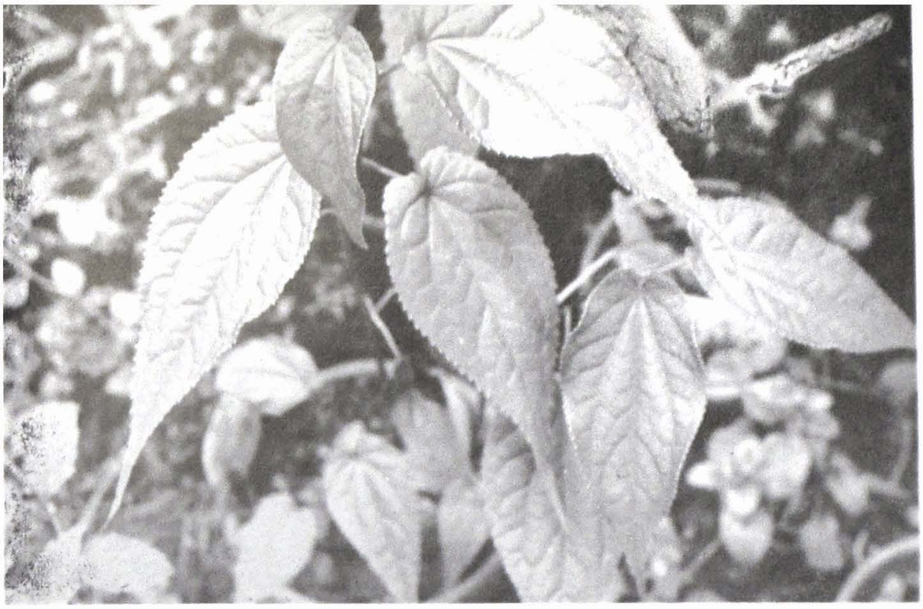
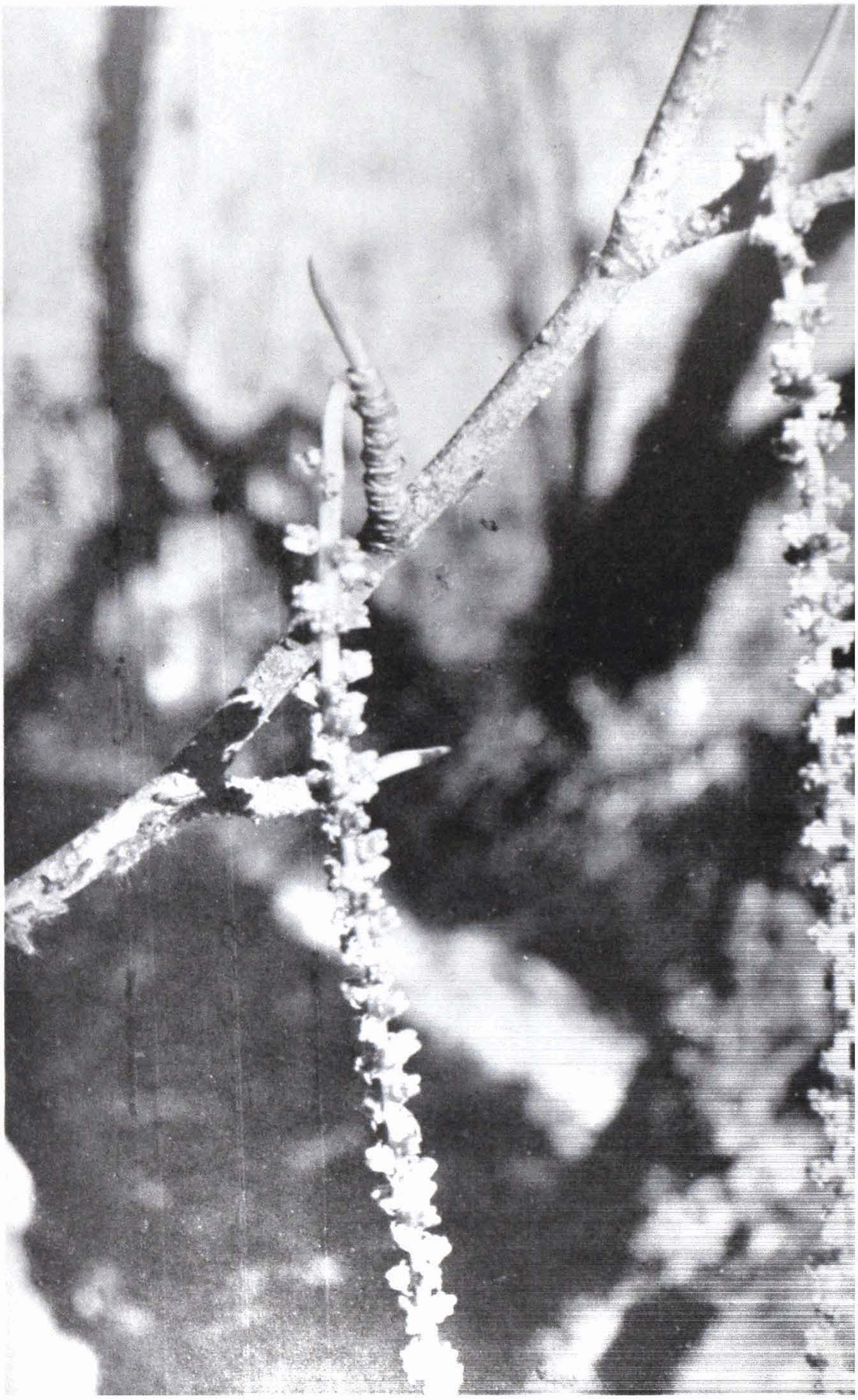


Plate 19. *Tetracentron sinense* var. *himalense*
a. Young plants of 2 years old



b. A fruiting branch

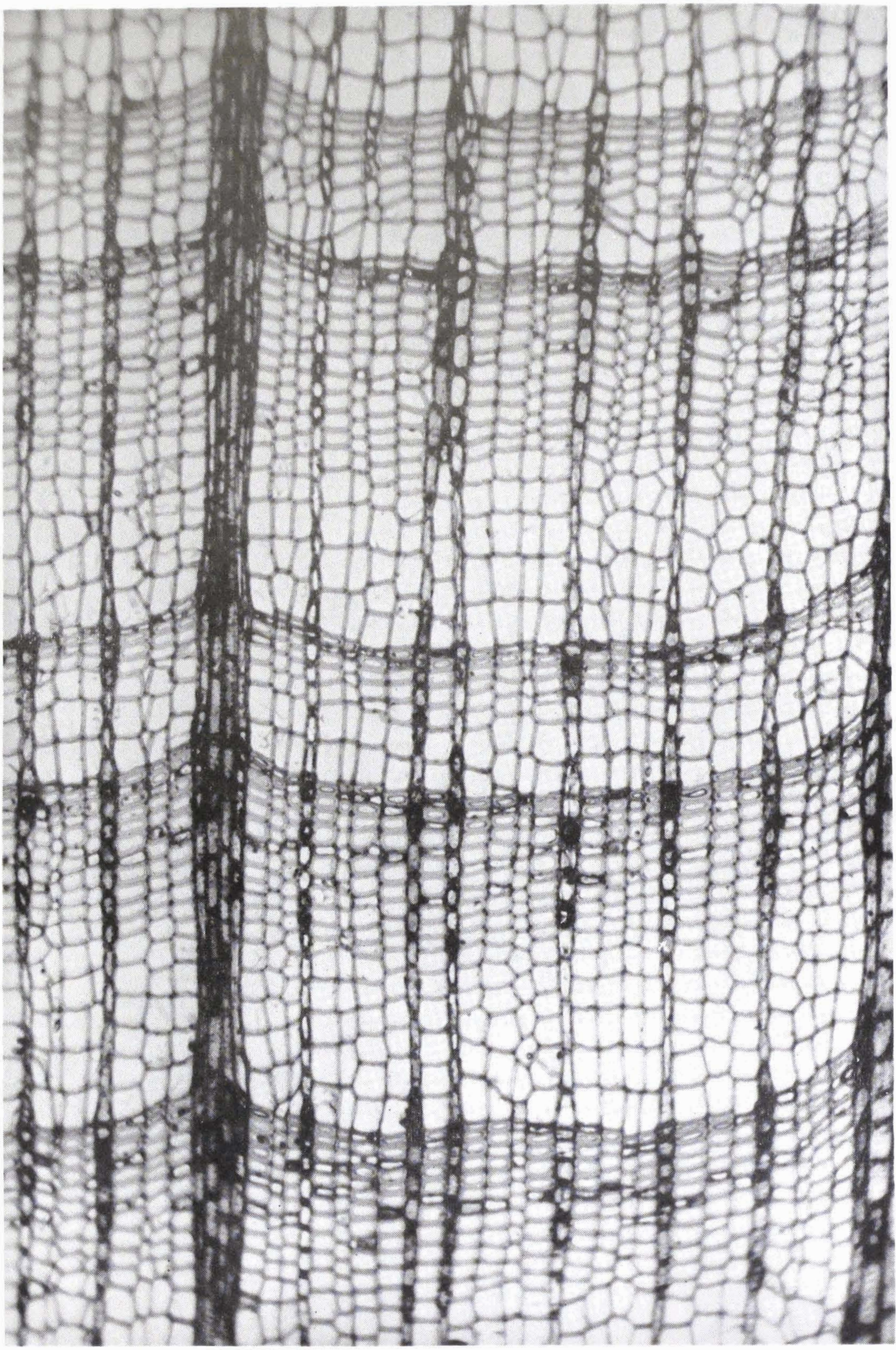


Plate 20. Transverse section of the wood of *Tetracentron sinense* var. *himalense*

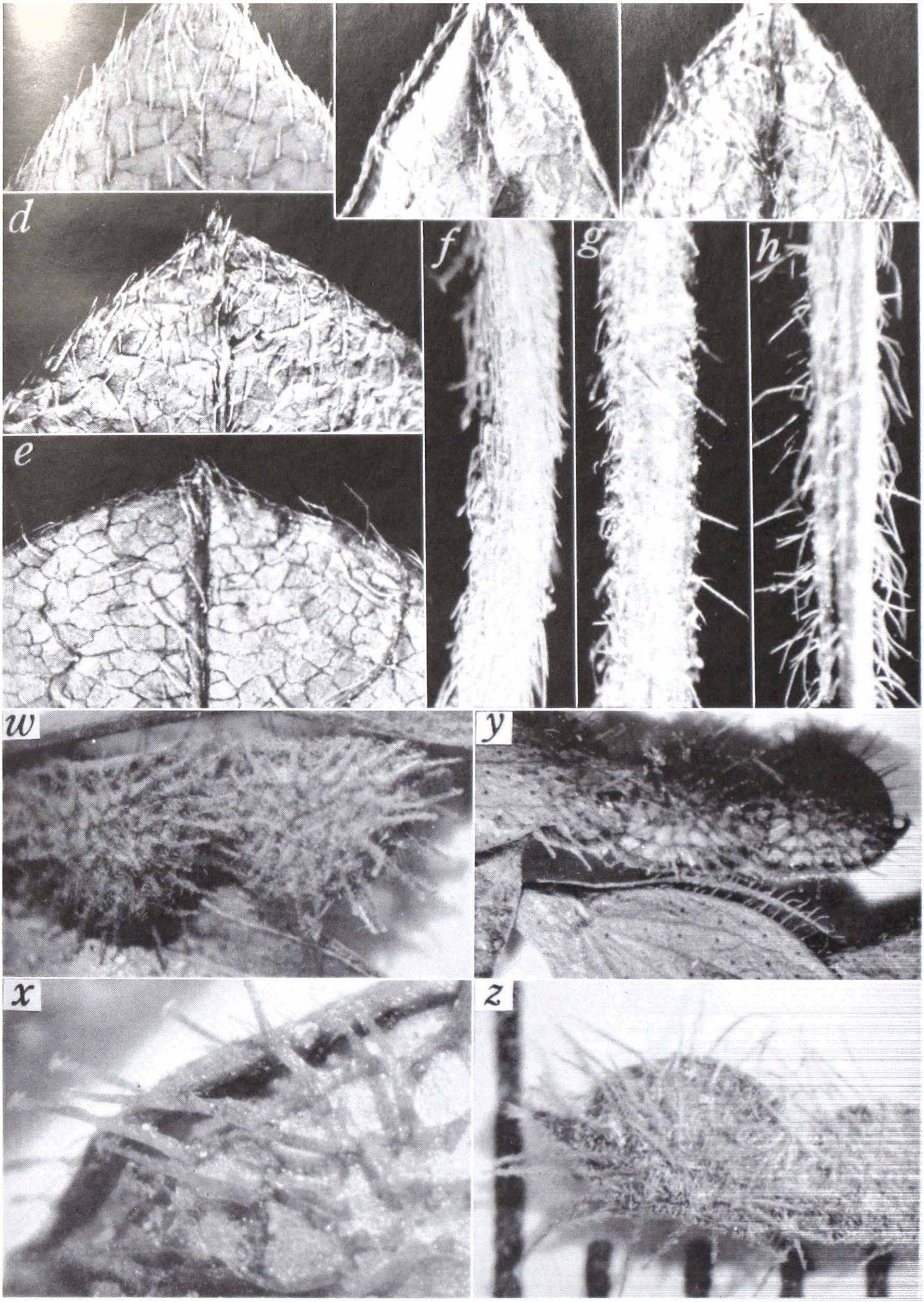


Plate 21. a–h. *Amphicarpaea bracteata*
w–z. *Zornia gibbosa*

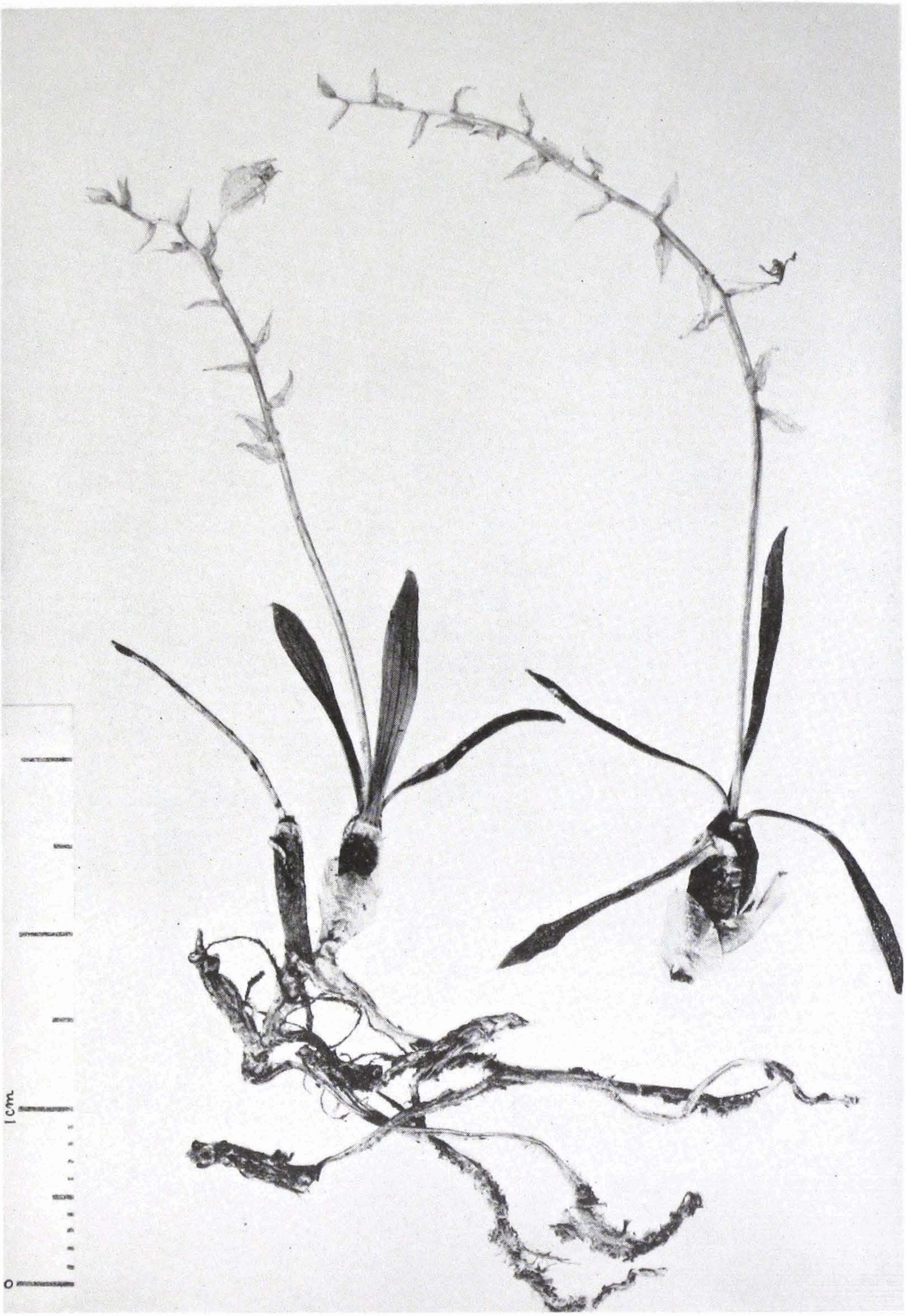


Plate 22. *Liparis Togashii* Tuyama

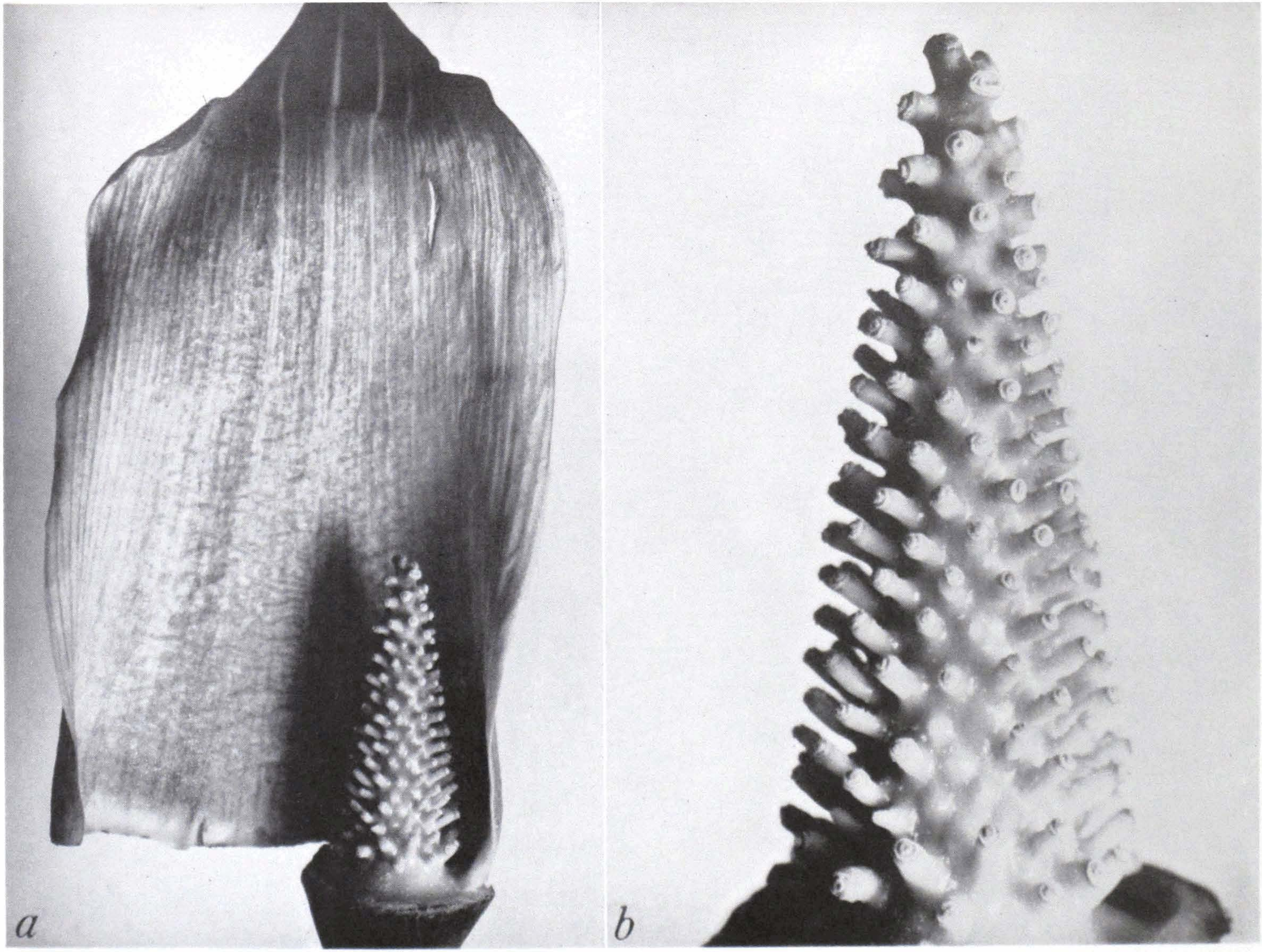


Plate 23. *Arisaema exappendiculata* Hara

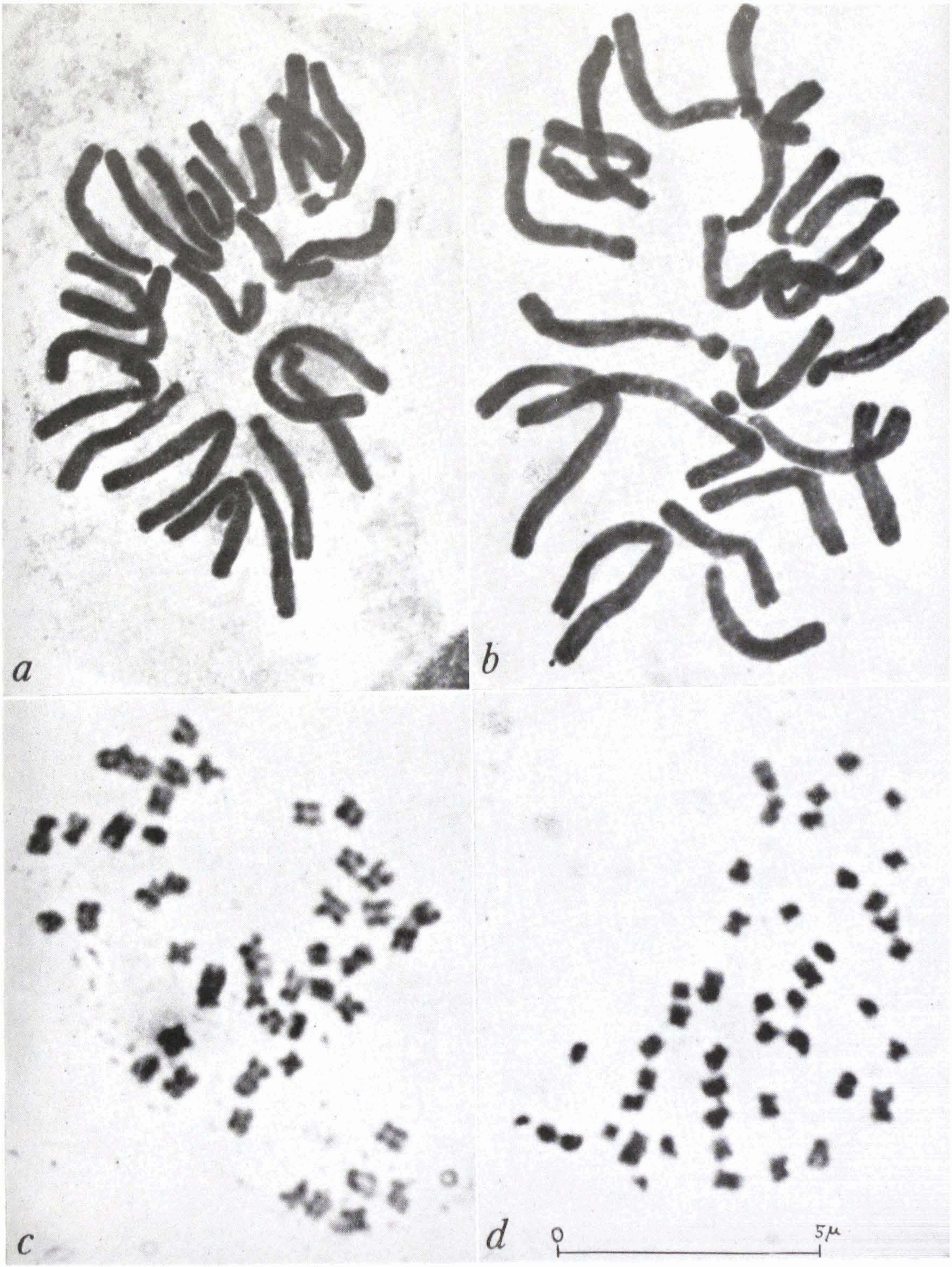


Plate 24. Photomicrographs of somatic chromosomes

a, b. *Trillium Govanianum* c, d. *Acorus Calamus*

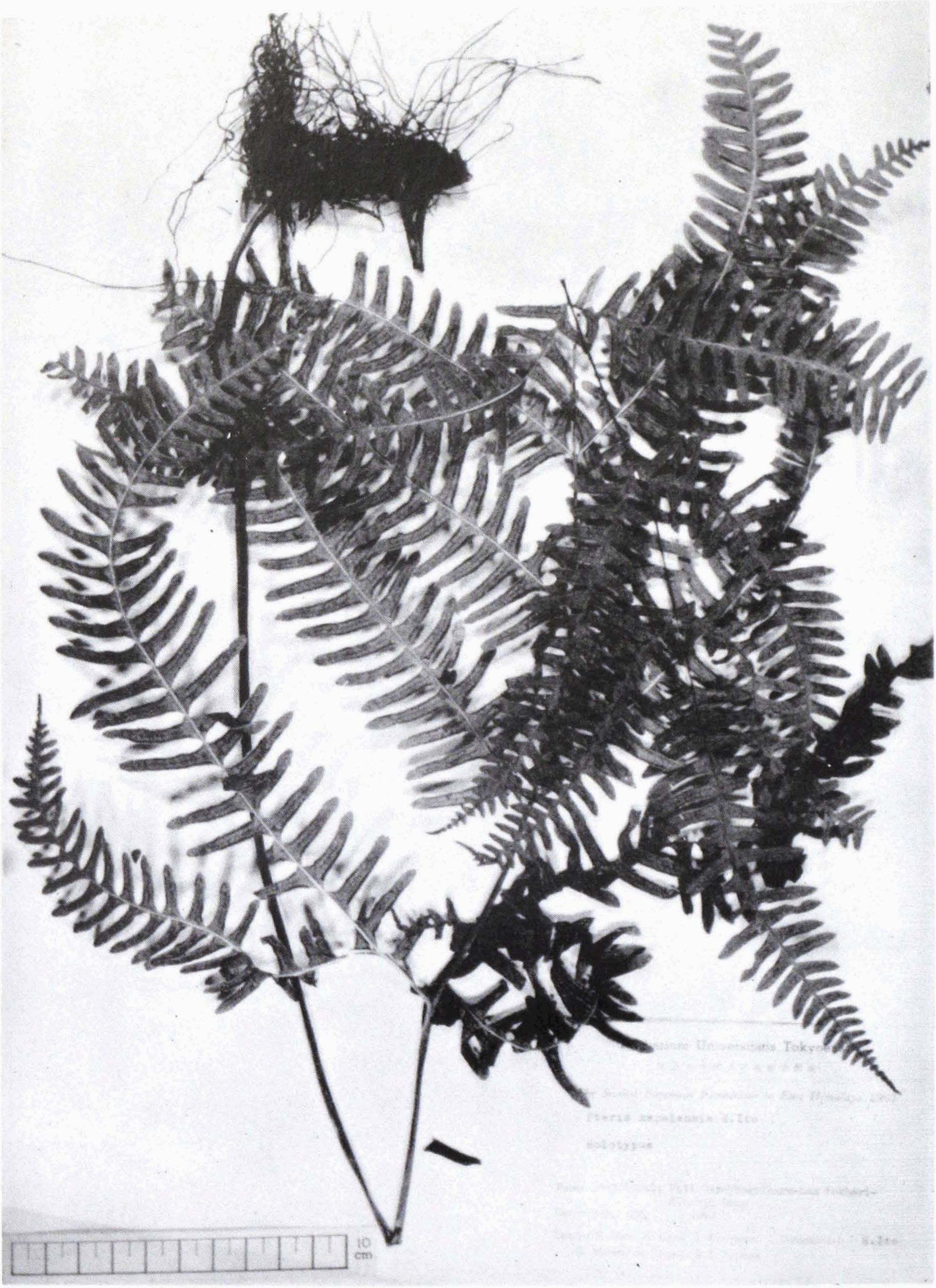


Plate 25. *Pteris nepalensis* H. Ito

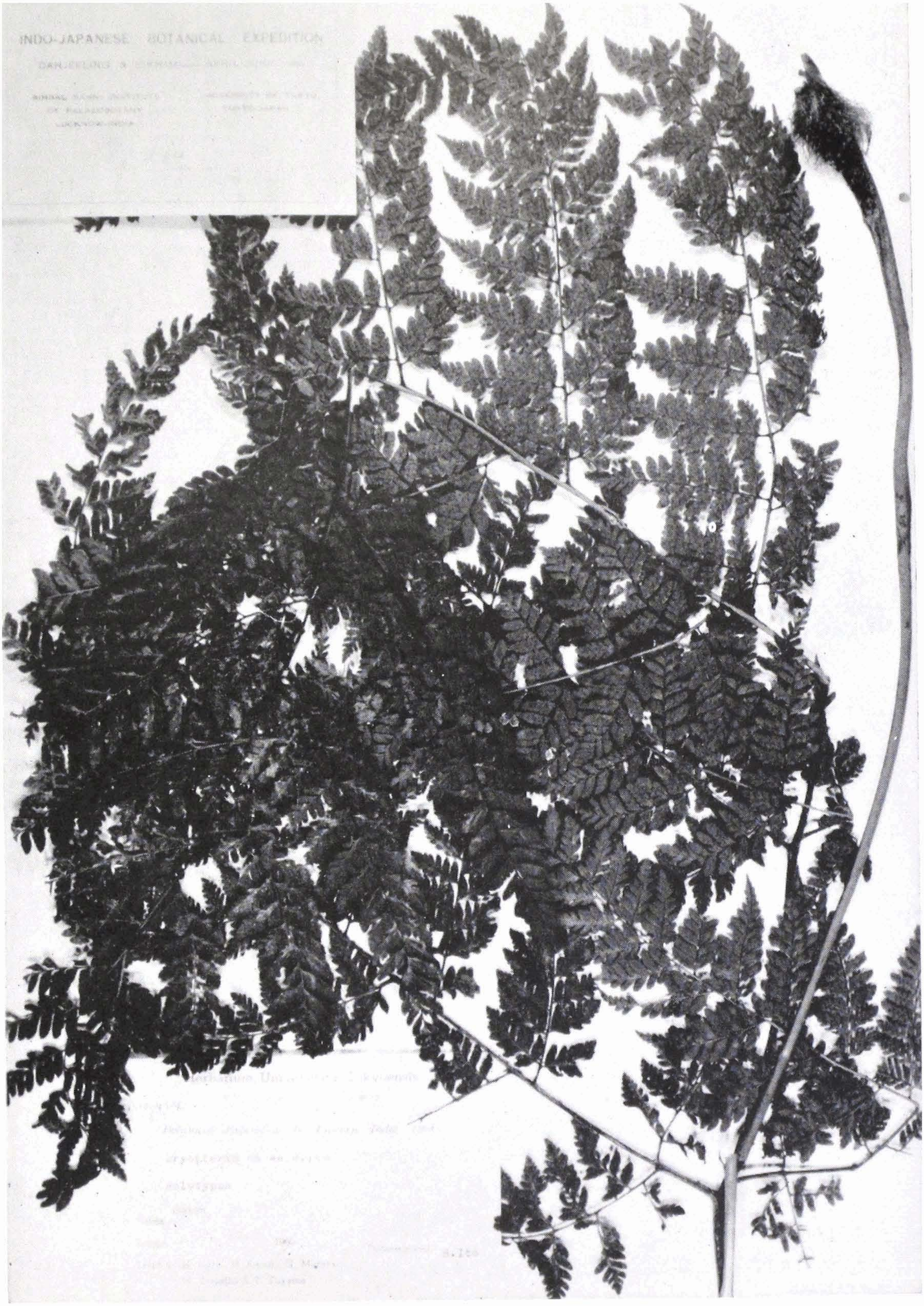


Plate 26. *Dryopteris Harae* H. Ito

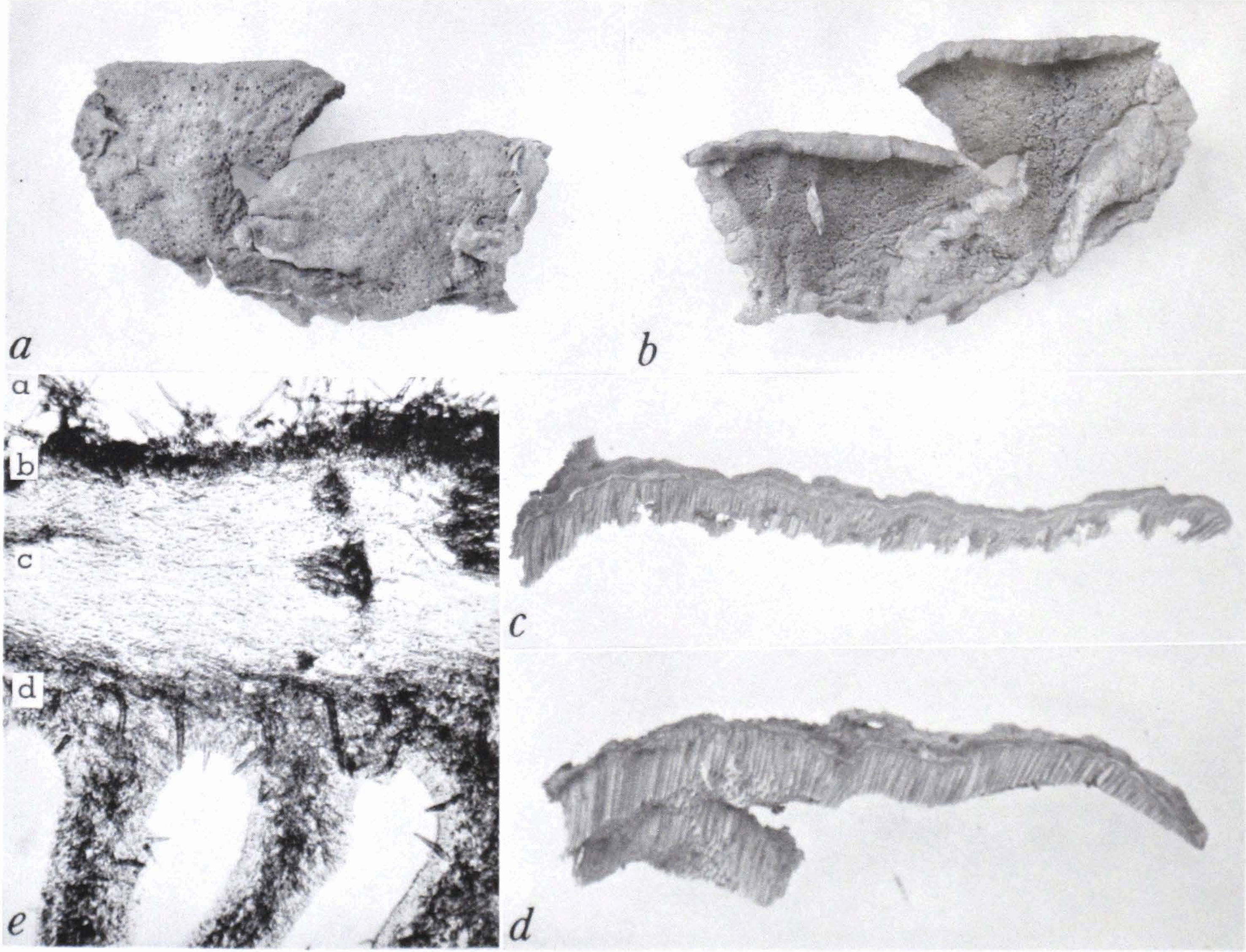


Plate 27. *Inonotus xeranticus* (Berk.) Imazeki et Aoshima

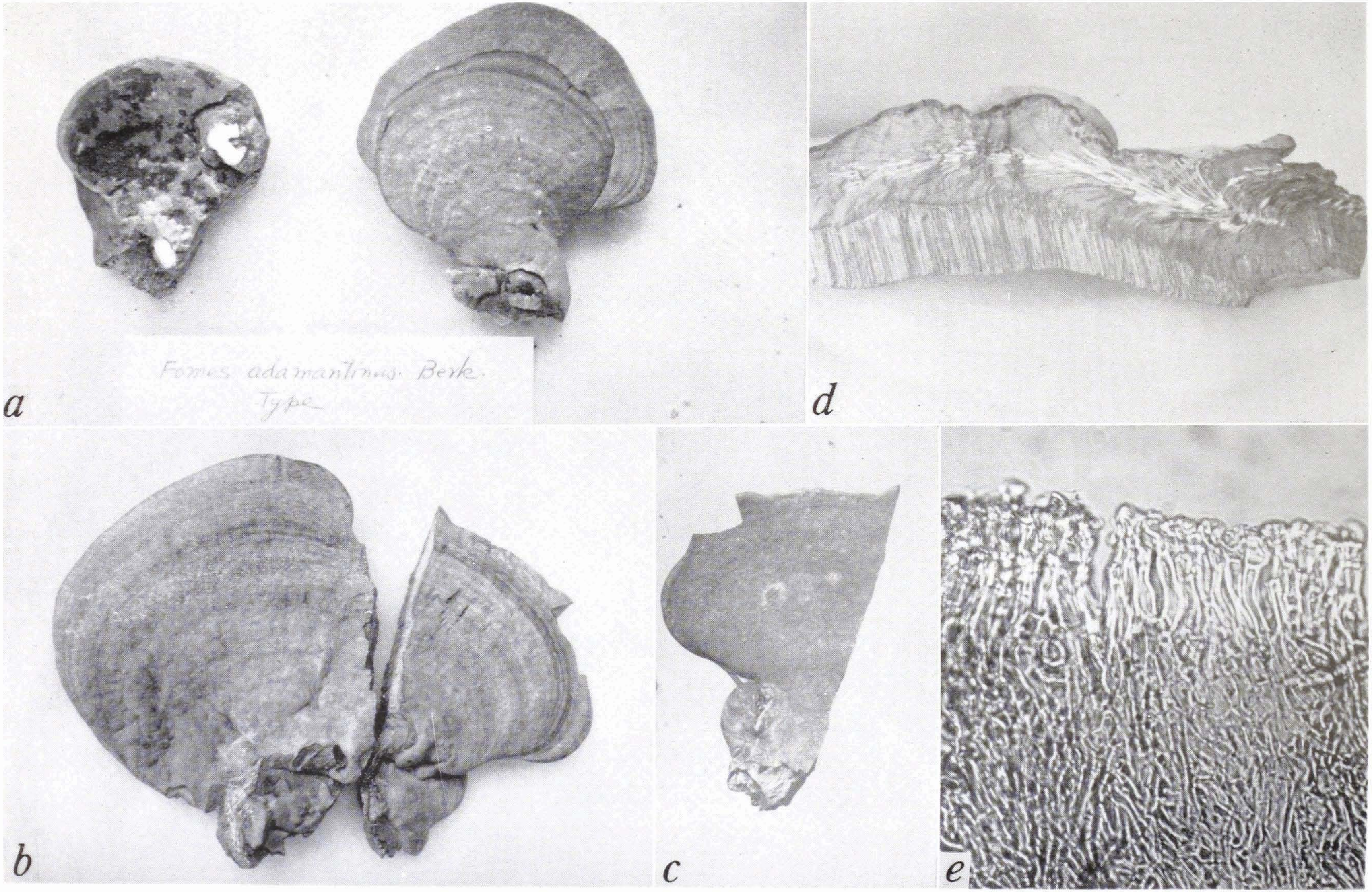


Plate 28. *Pyrrhoderma adamantinum* (Berk.) Imazeki

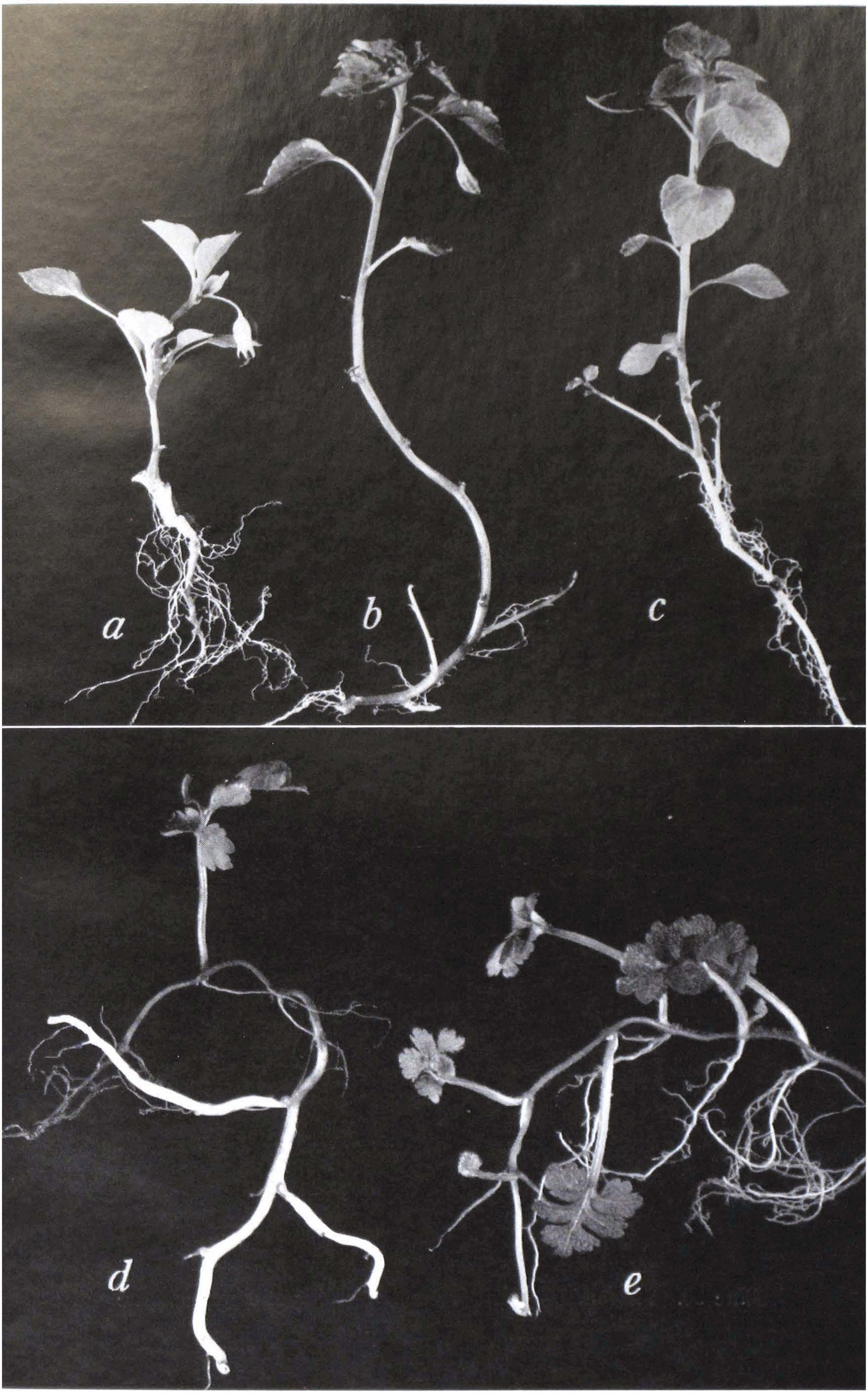


Plate 29. a–c. *Peracarpa carnosa*. Photo in Tokyo (May 23, 1963)
d–e. *Ellisiophyllum pinnatum*. Photo in Tokyo (Feb 4, 1965)

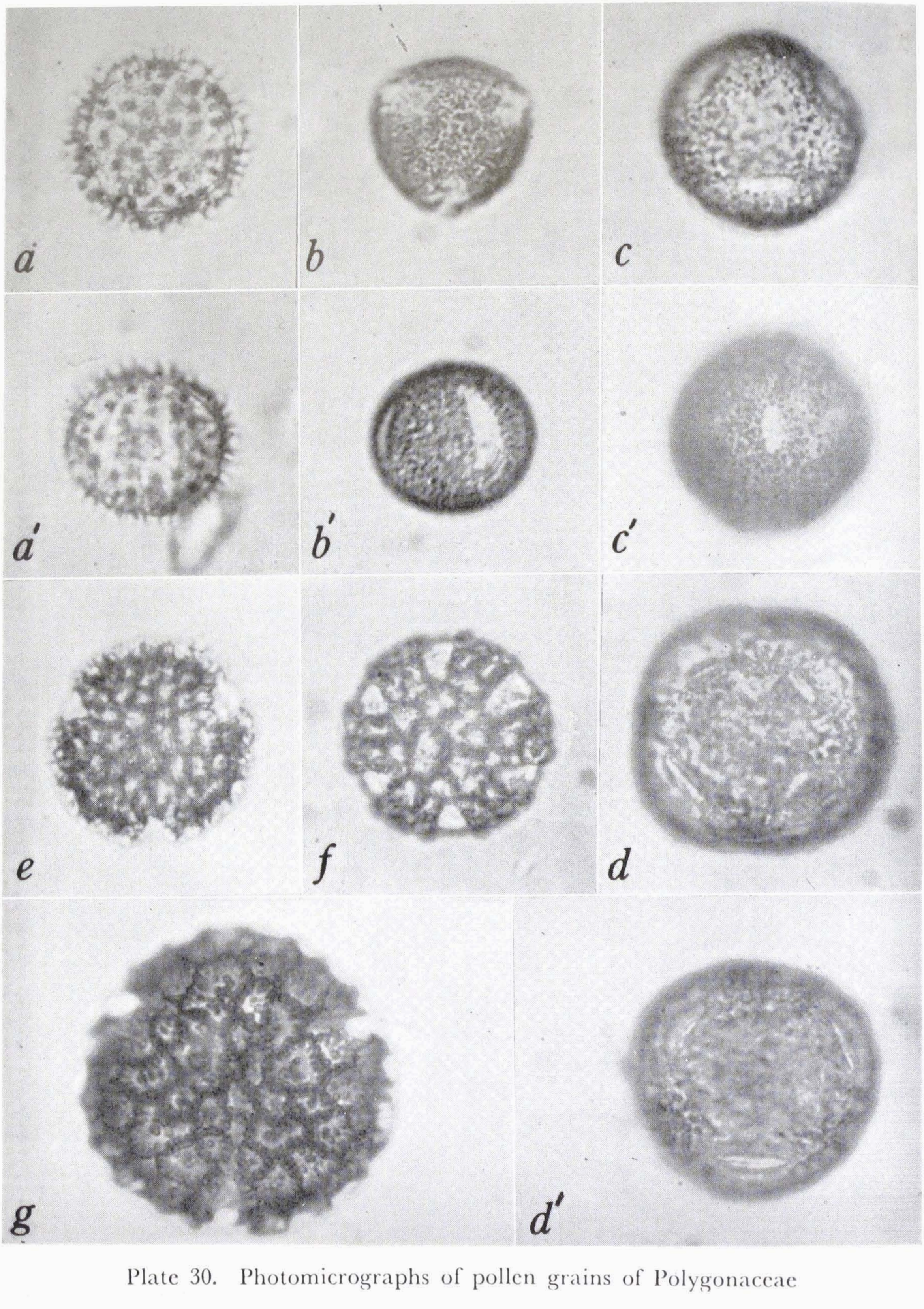


Plate 30. Photomicrographs of pollen grains of Polygonaceae

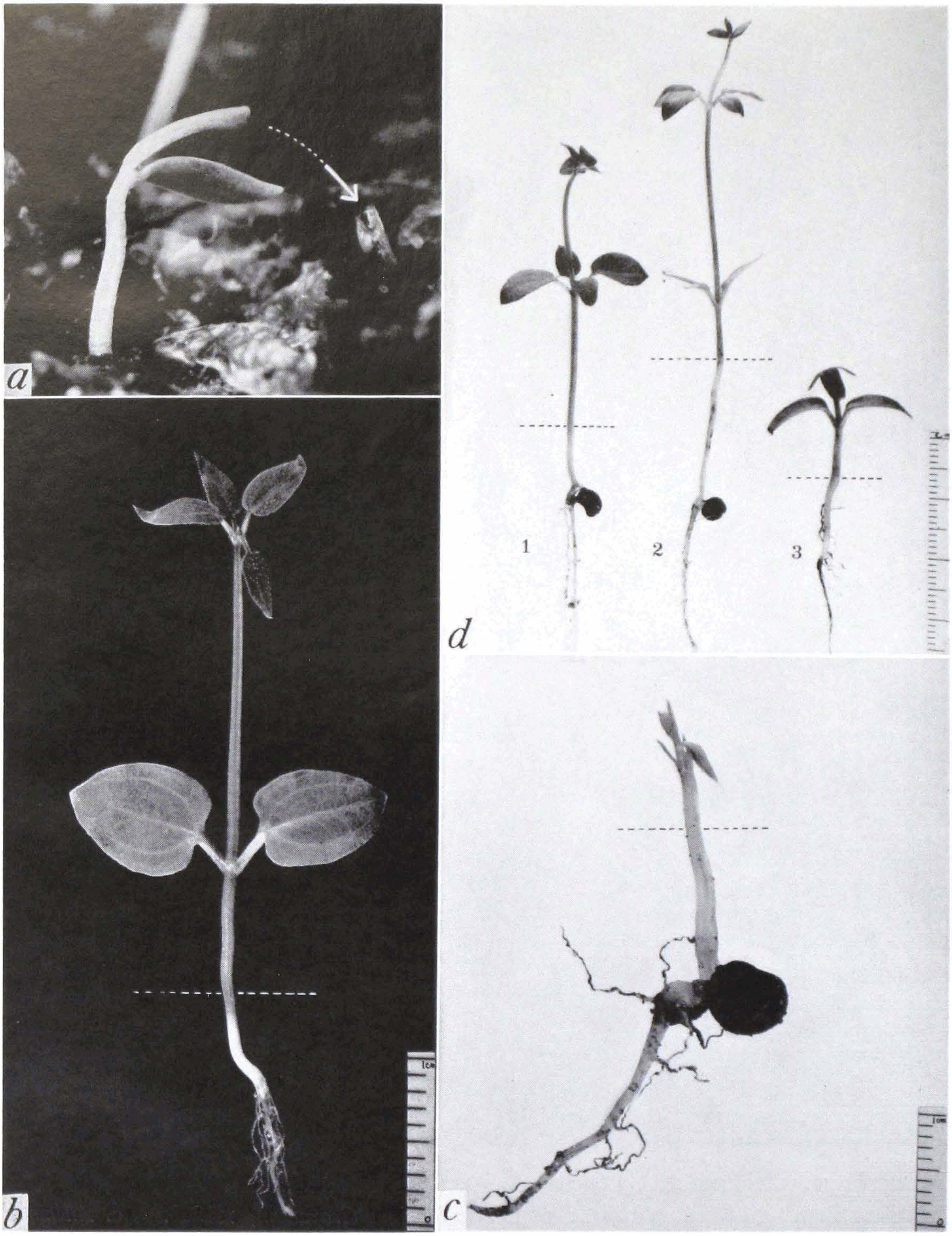


Plate 31. Seedlings of the *Rubia cordifolia* group

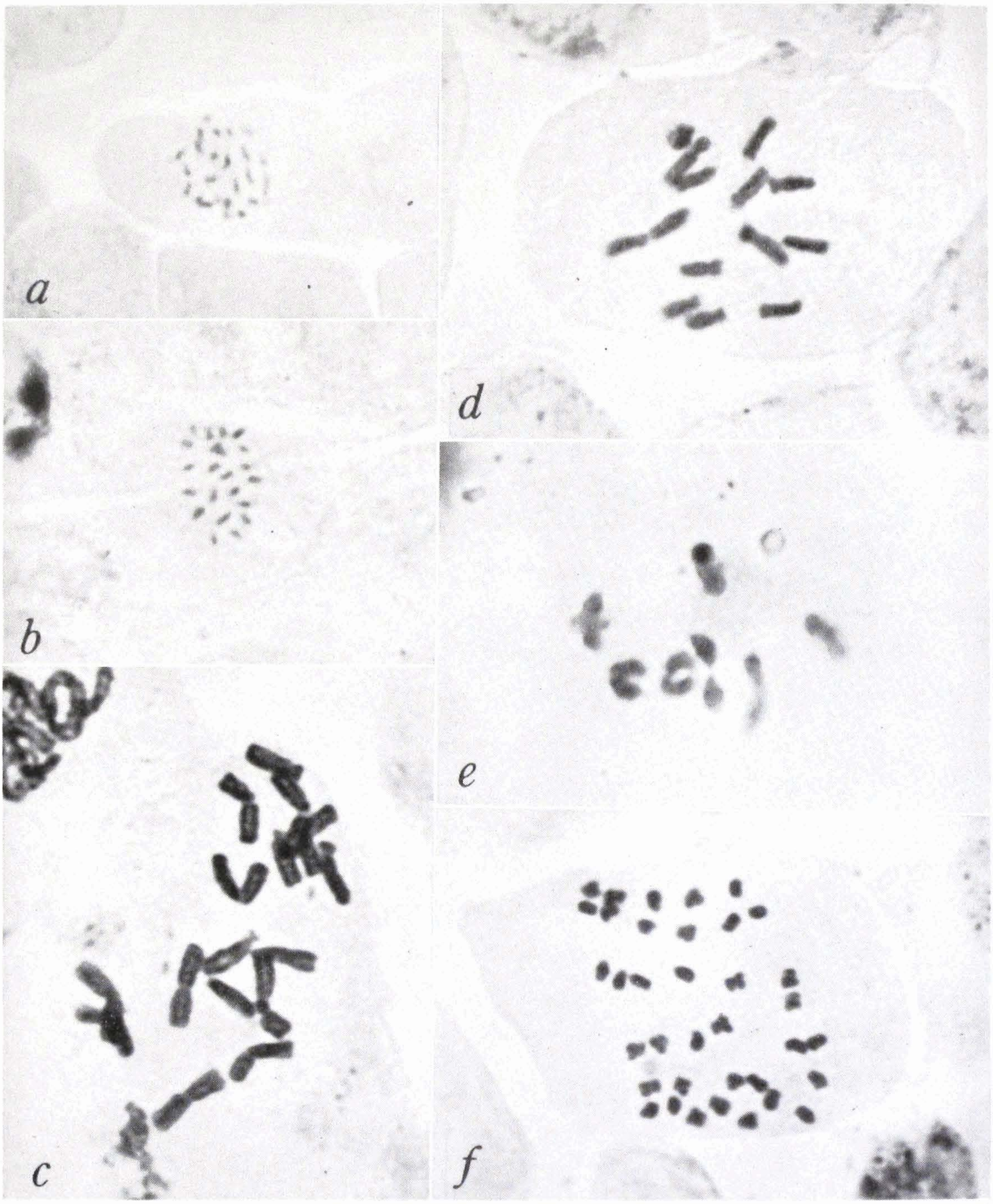


Plate 32. Photomicrographs of chromosomes

a. *Chrysosplenium nepalense*, ×1500 b. *Chrysosplenium Grayanum*, ×1500. c. *Anemone vitifolia*, ×1500. d. *Chrysosplenium lanuginosum*, somatic chromosomes, ×1800. e. The same, gametic chromosomes, ×1800. f. *Dichroa febrifuga*, ×1500.

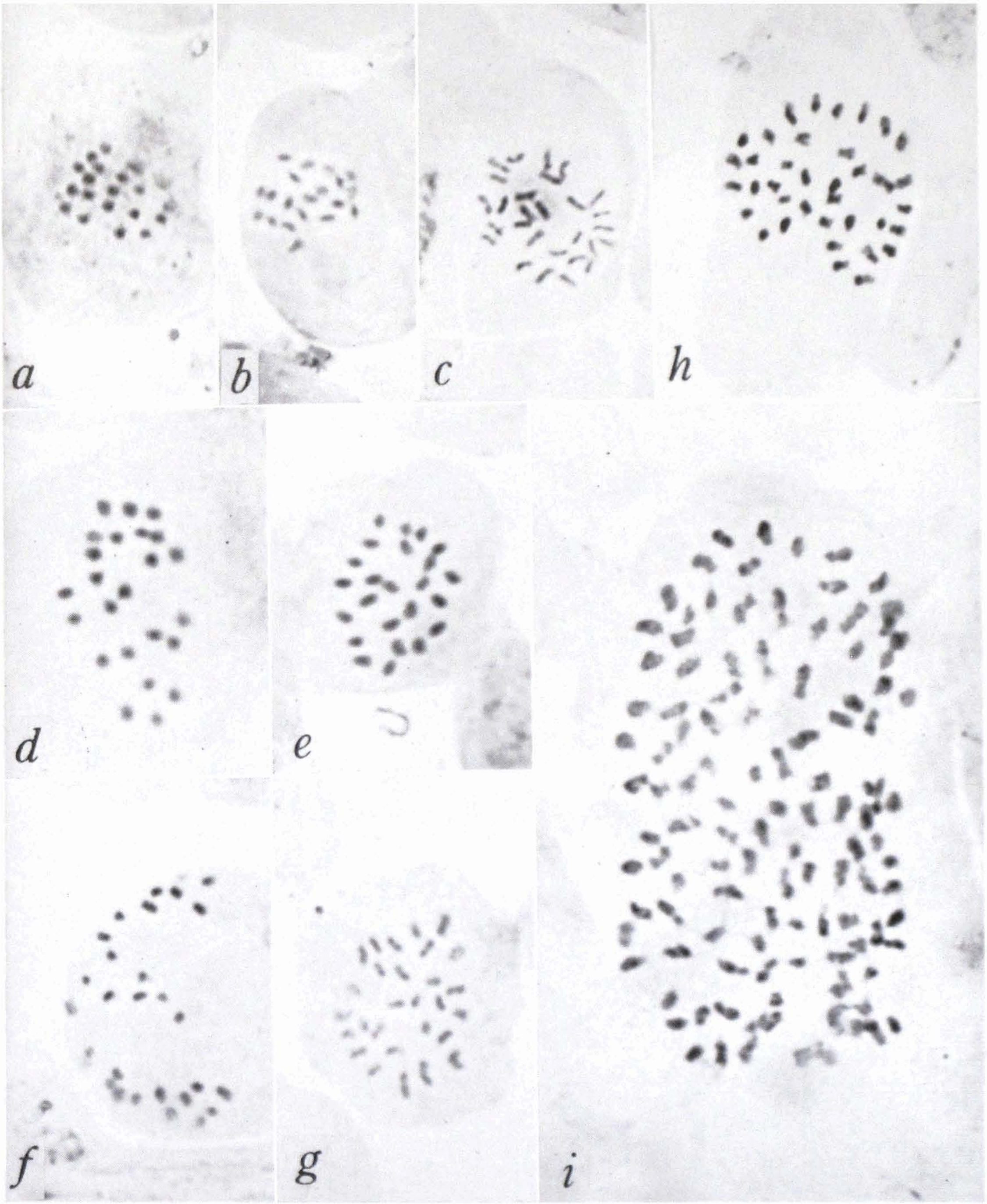


Plate 33. Photomicrographs of chromosomes

a. *Boenninghausenia albiflora* var. *japonica*, ×1500. b. *Boenninghausenia albiflora*, ×1500. c. *Geranium nepalense*, ×1500. d. *Stachyurus praecox*, ×2000. e. *Stachyurus himalaicus*, ×2000. f. *Phryma Leptostachya*, from Karuizawa, ×1500. g. The same, from Godavari, ×1500. h. *Helwingia himalaica*, ×1500. i. *Helwingia japonica*, ×1500.

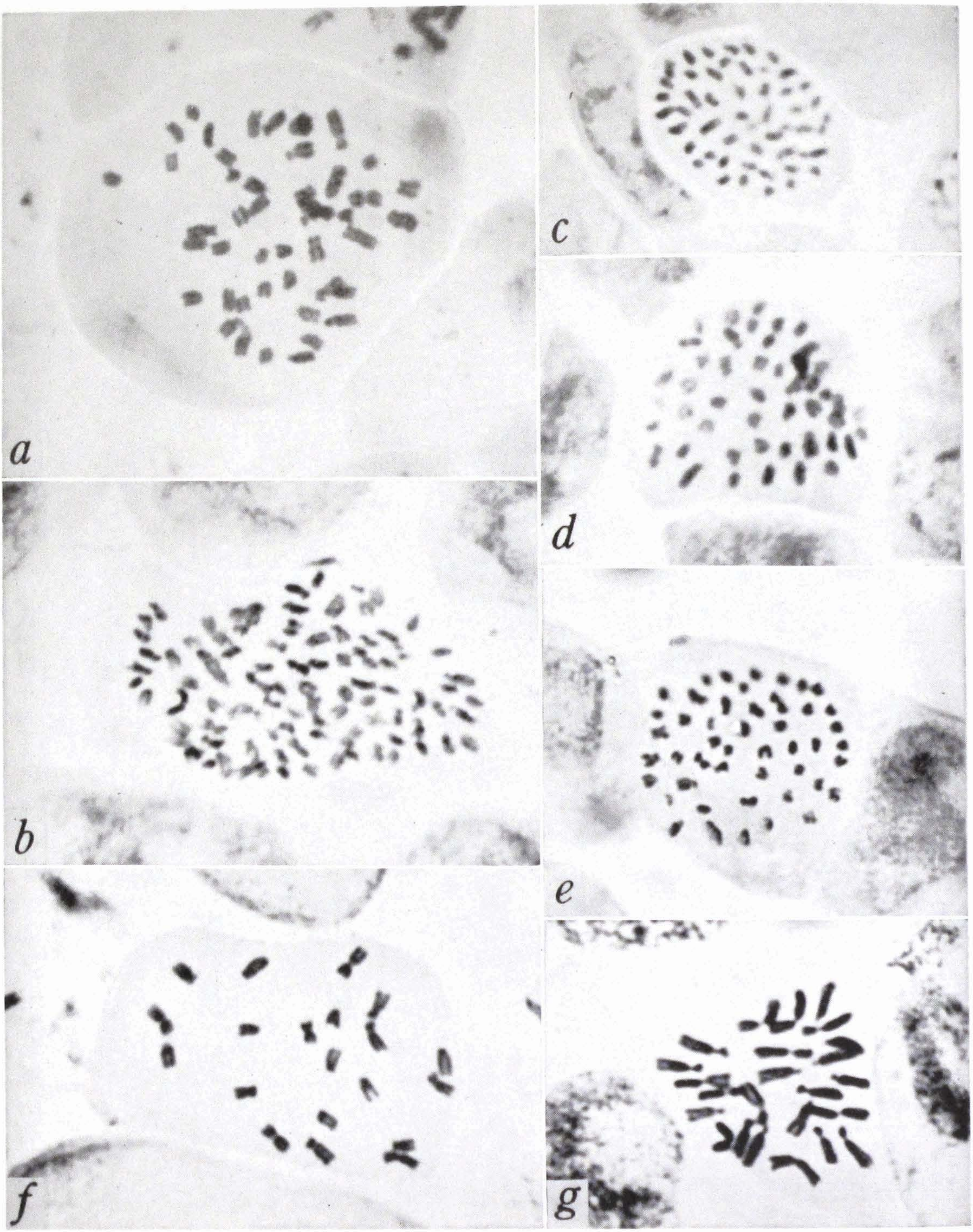


Plate 34. Photomicrographs of chromosomes

a. *Lysimachia congestiflora*, ×1500. b. *Lysimachia debilis*, ×1500. c, d, e. *Lysimachia ferruginea*, ×1500. f. *Lysimachia japonica*, ×1500. g. *Lysimachia Tashiroi*, ×1500.

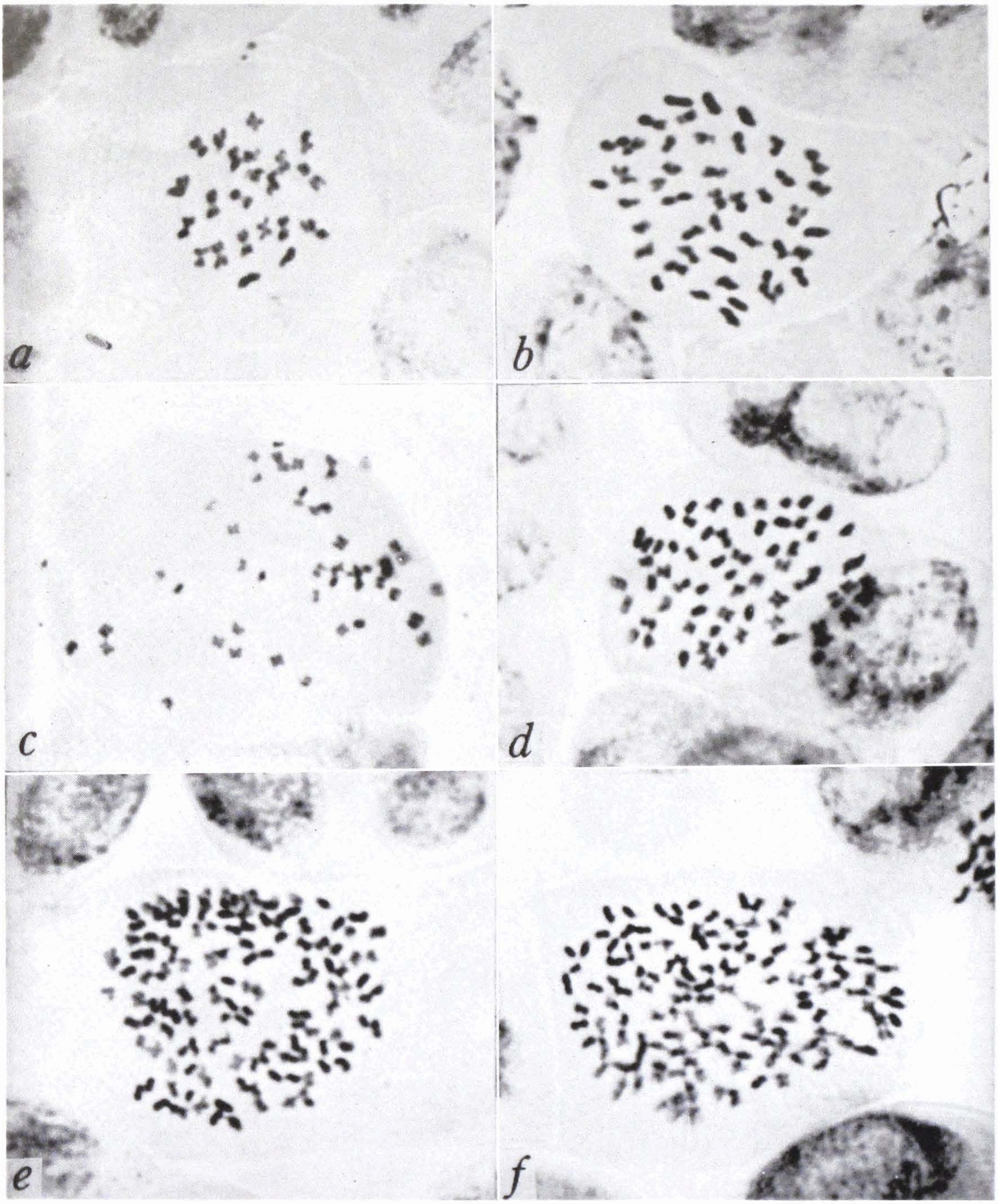


Plate 35. Photomicrographs of chromosomes

a. *Rubia cordifolia*, ×1500. b. *Rubia Akane*, ×1500. c. *Rubia Wallichiana*, ×1500. d. *Rubia Manjith*, ×1500. e. *Rubia sikkimensis*, ×1500. f. *Rubia Wallichiana*, ×1500.

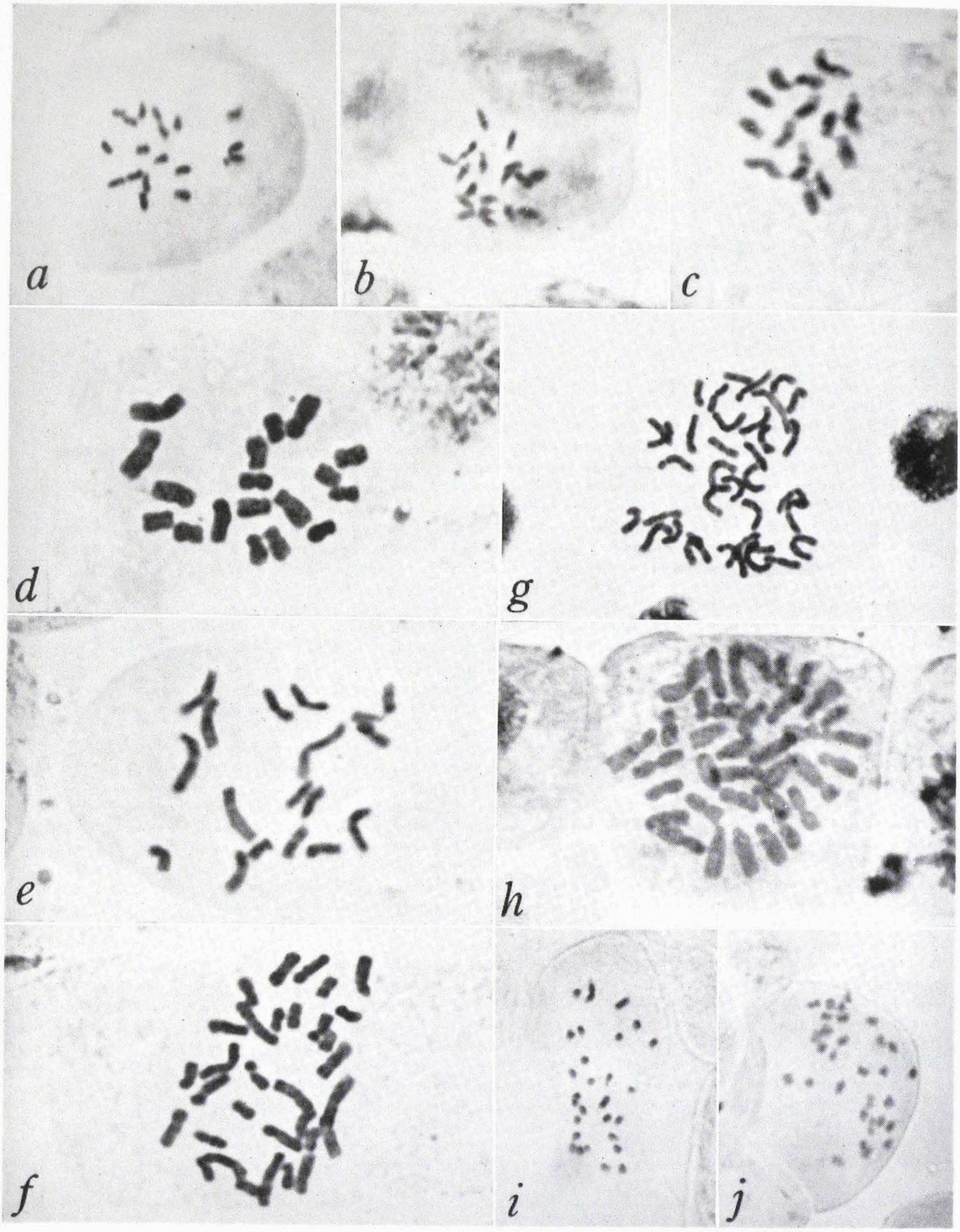


Plate 36. Photomicrographs of chromosomes

a. *Ellisiophyllum pinnatum*, ×1500. b. *E. pinnatum* var. *reptans*, ×1500. c. *Valeriana Hardwickii*, ×2000. d. *Viburnum coriaceum*, ×1500. e. *Viburnum Mullaha*, ×1500. f. *Viburnum erubescens*, ×1500. g. *Sambucus adnatus*, ×1200. h. *Sambucus Hookeri*, ×1200. i. *Perecarpa carnosa* var. *circaeoides*, ×1200. j. *Peracarpa carnosa*, ×1200.

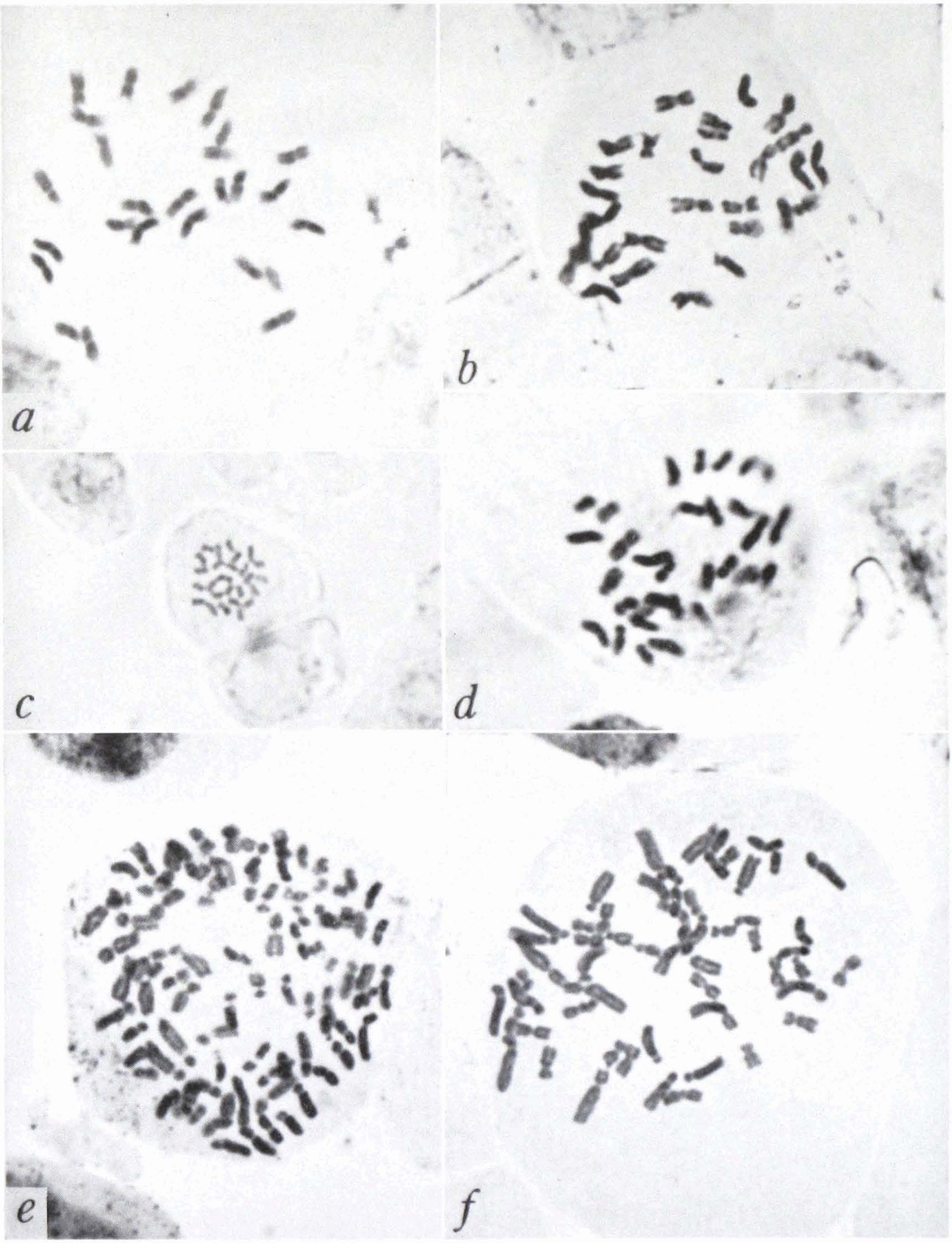


Plate 37. Photomicrographs of chromosomes

a. *Arisaema speciosum*, ×1500. b. *Arisaema exappendiculatum*, ×1500. c. *Aletris sikkimensis*, ×1500. d. *Belamcanda chinensis*, ×1500. e. *Chlorophytum arundinaceum*, ×1200. f. *Chlorophytum nepalense*, ×1200.

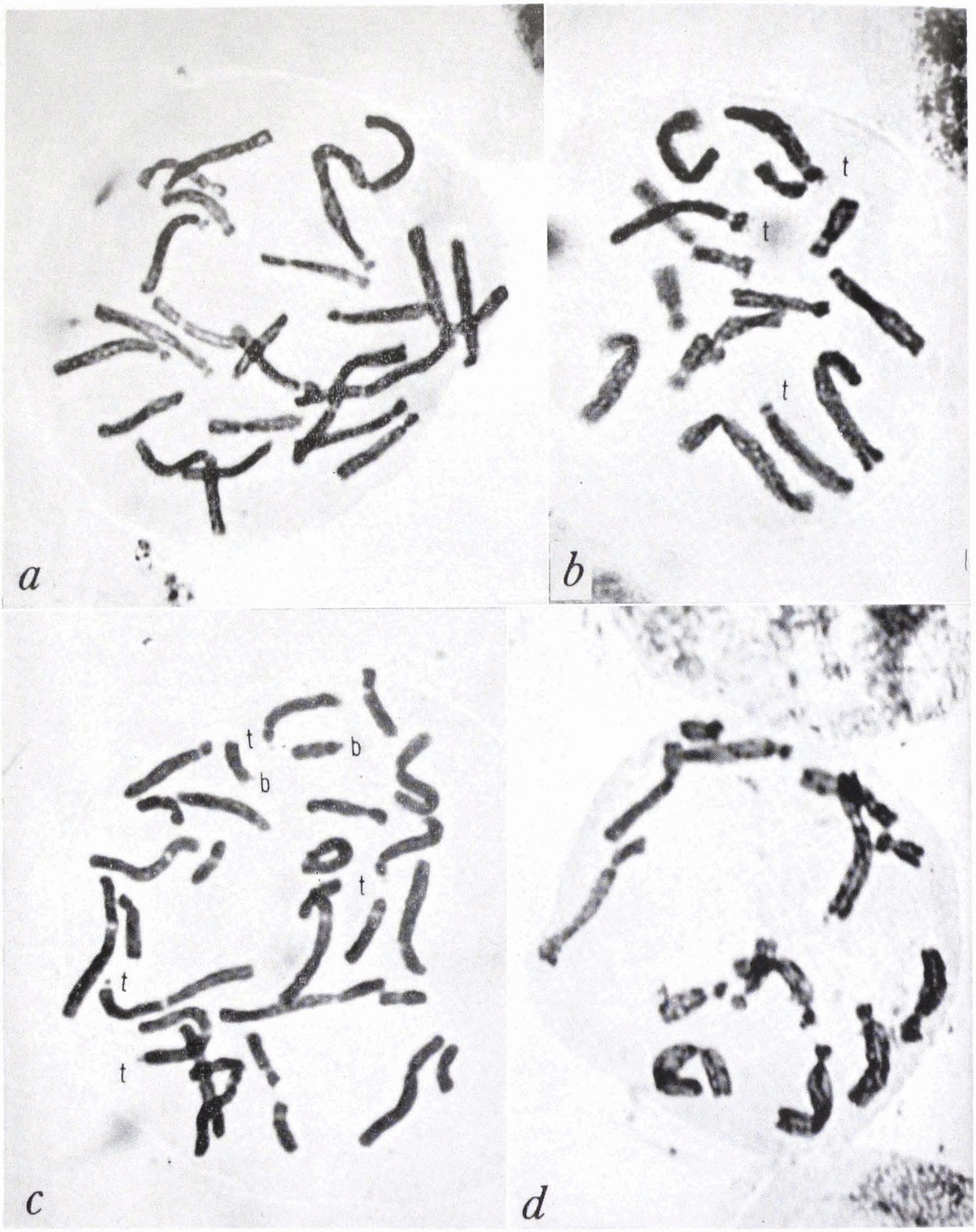


Plate 38. Photomicrographs of chromosomes

a. *Cardiocrinum giganteum*, ×1200. b. *Disporum cantoniense*, cult. in Japan, ×1200. c. *Disporum cantoniense* var. *parviflorum*, Darjeeling, 2n=30, ×1200. d. The same, from Garhi Danra, E. Nepal 2n=14, ×1200.

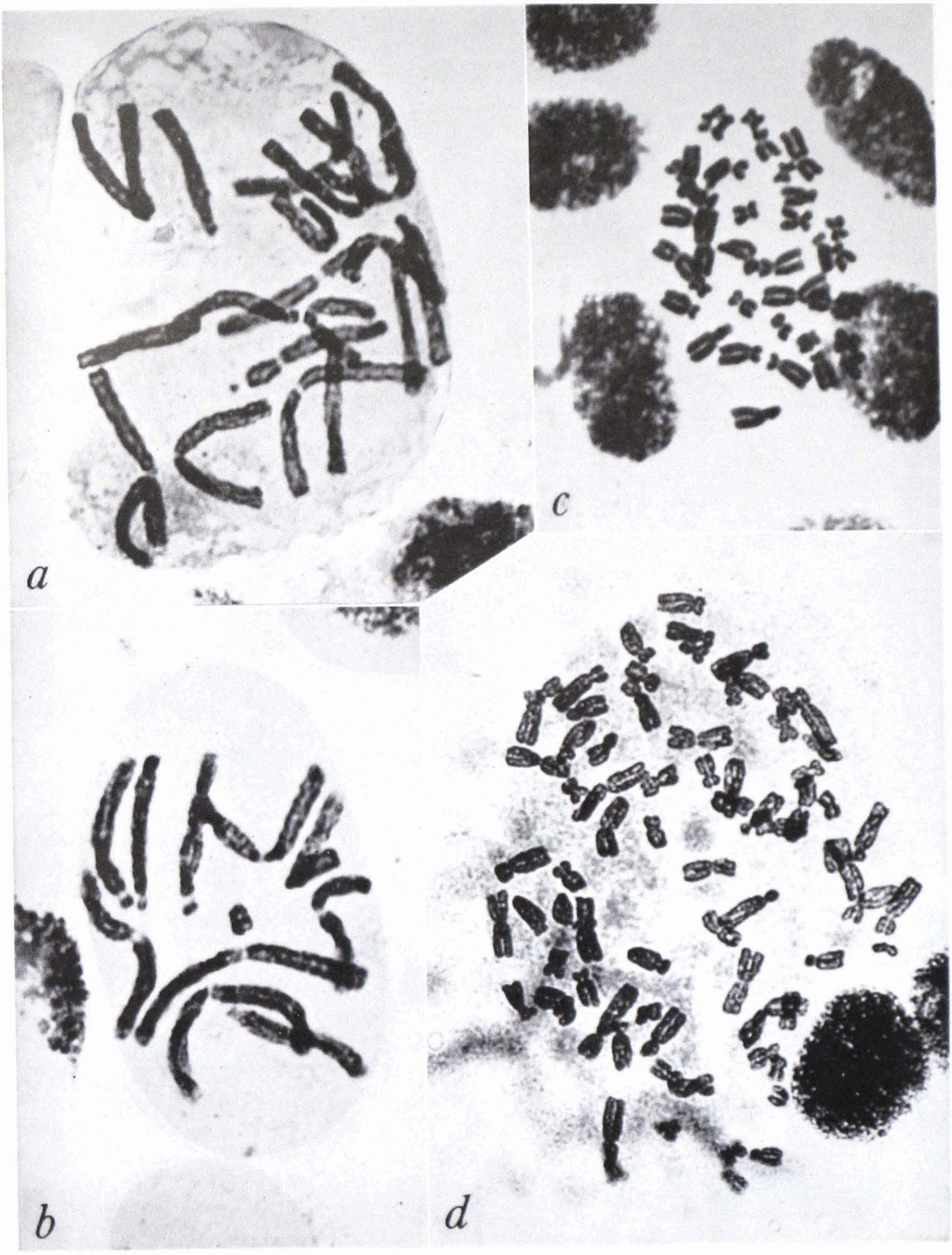


Plate 39. Photomicrographs of chromosomes

a. *Paris polyphylla*, $2n=20$, ×1200. b. The same, $2n=10+1B$, ×1200. c. *Smilacina purpurea*, ×1200. d. *Smilacina fusca*, ×950.

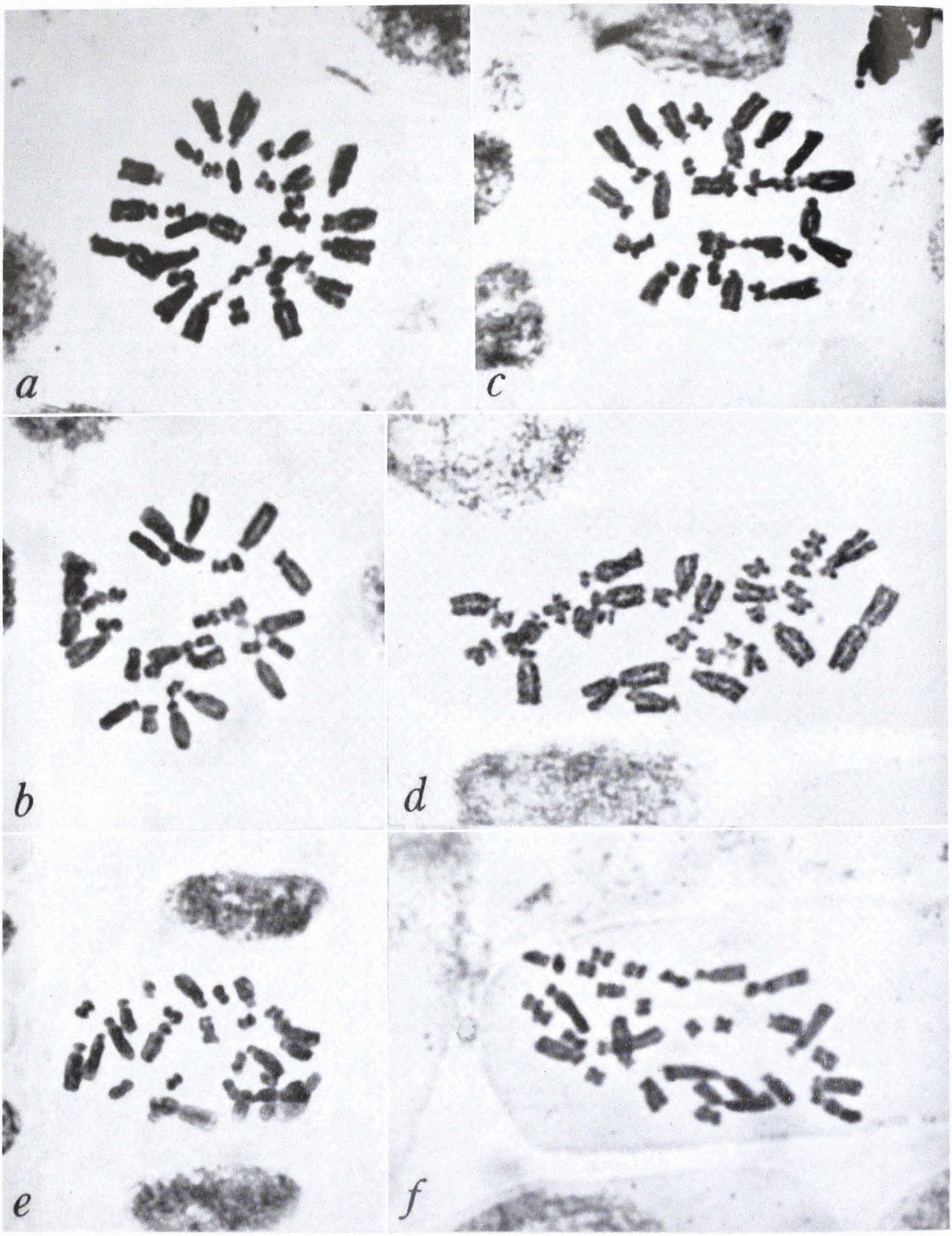


Plate 40. Photomicrographs of chromosomes

a. *Polygonatum punctatum*, ×1400. b. The same, ×1400. c. *Polygonatum oppositifolium*, ×1400. d. The same, ×1400. e. *Polygonatum verticillatum*, ×1400. f. *Polygonatum cirrhifolium*, ×1400.

MEMBERS AND ITINERARY

Our botanical expeditions consisted of two major and two minor trips.

1. Date: April–June, 1960.
   Region: Darjeeling, the Singalila Range, Jongri, Gangtok and Kalimpong (Figs. 2 and 3; Folded Map).
   Members:

Hiroshi Hara	University of Tokyo
Hiroo Kanai	University of Tokyo
Gen Murata	Kyoto University
Makoto Togashi	Takeda Pharmaceutical Laboratory, Osaka
Takasi Tuyama	Ochanomizu University, Tokyo
Itaru Wada	Bangkok (Medical Doctor)

2. Date: March–April, 1963.
   Region: Darjeeling, Gangtok and Temi (Fig. 2; Folded Map).
   Member: Hiroshi Hara University of Tokyo.
3. Date: September–December, 1963.
   Region: Easternmost Nepal (the Tamur Valley), Kathmandu and Darjeeling (Figs. 2, 4 and 5; Folded Map).
   Members:

Hiroshi Hara	University of Tokyo
Hiroo Kanai	University of Tokyo
Sachiko Kurosawa	University of Tokyo
Gen Murata	Kyoto University
Makoto Togashi	Takeda Pharmaceutical Laboratory, Osaka
Takasi Tuyama	Ochanomizu University, Tokyo

4. Date: September 1964.
   Region: Darjeeling, Gangtok and Sandakphu (Fig. 2; Folded Map).
   Member: Hiroshi Hara University of Tokyo.

The chronological record of the trips is given in the following pages.

Abbreviations: *Ha*—H. Hara, *Ka*—H. Kanai, *Ku*—S. Kurosawa, *Mu*—G. Murata, *To*—M. Togashi, *Tu*—T. Tuyama.

* * * * *

The First Major Trip to Sikkim. April–June, 1960. (*Ha*, *Ka*, *Mu*, *To* & *Tu*)

March 1960

31 *HaTo* Darjeeling (2150 m)

April 1960

1 Do. (Lloyd Bot. Gard. & St. Paul Hill, 2250 m)

2 Do. (Lloyd Bot. Gard. & Observatory Hill, 2180 m)

3 Do. (Victoria Fall, 1950 m & Senchal Lake, 2300 m)

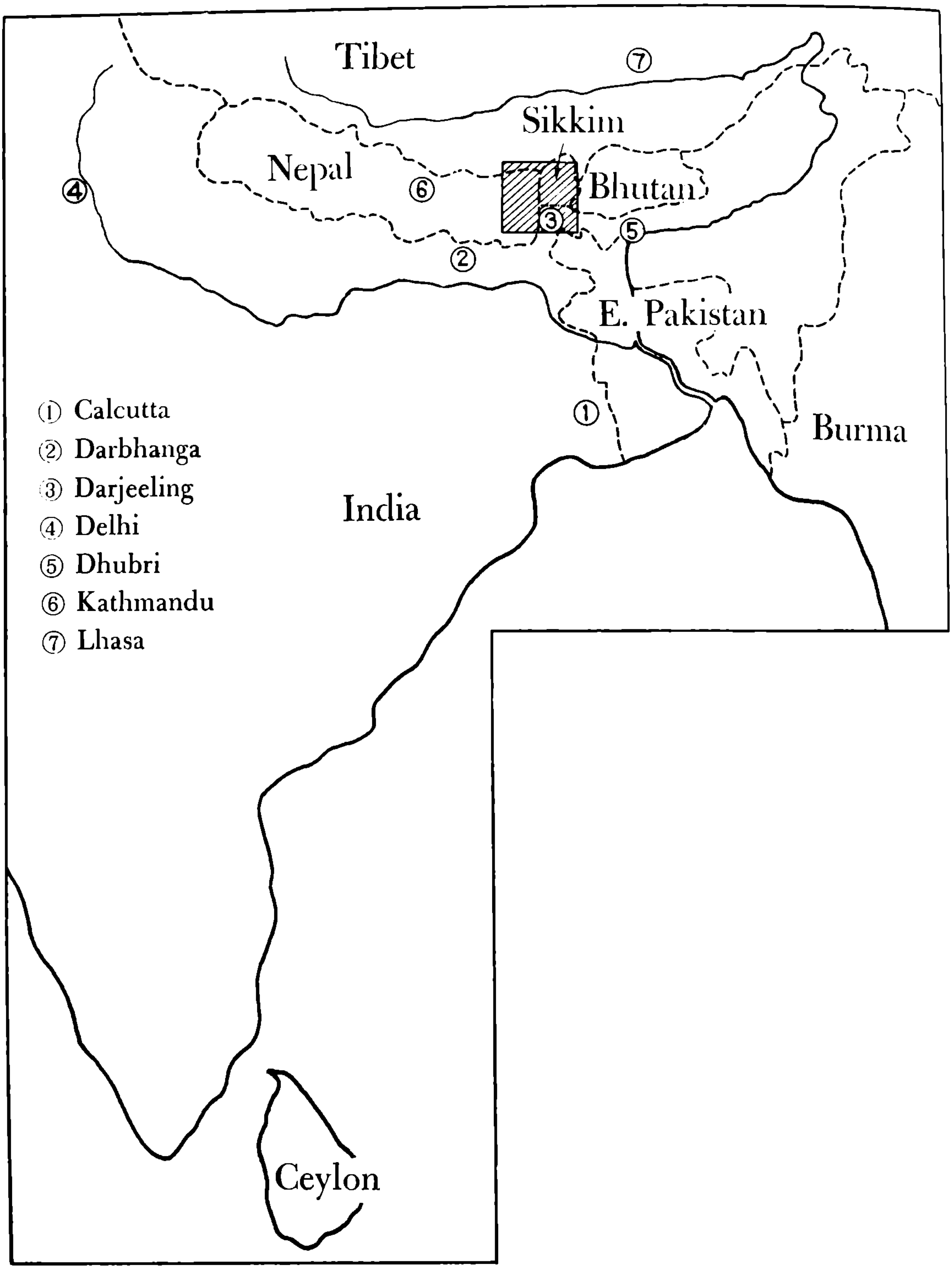


Fig. 1. Nepal, Sikkim, and neighboring regions. Hatched area is shown in detail in the folded map and also in Fig. 2.

April 1960

4	*HaTo*	Darjeeling–Ghum (2300 m)–Senchal (2400 m), and return		
5		Darjeeling (Tenzing Norkay Road & Birch Hill, 2050 m)		
6		Darjeeling–Senchal–Ghum, and return		
7		Darjeeling (Birch Hill)		
8		Do. (Victoria Fall & St. Paul Hill)		
9		Do. (2100 m)		
10	*Ha*	Do.	*To*	Darjeeling–Kurseong (1550 m)
11		Do.		Kurseong
12		Do.		Do.
13		Do.		Kurseong–Darjeeling
14	*HaTo*	Do.		
15		Darjeeling–Senchal (2400 m)		
16		Senchal–Tiger Hill (2500 m), and return		
17		Senchal–Simkuna Bazar (2300 m)–Takdah (1600 m)		
18		Takdah		
19		Do. (1600–1700 m)		
20		Takdah–Rayang (250 m)		

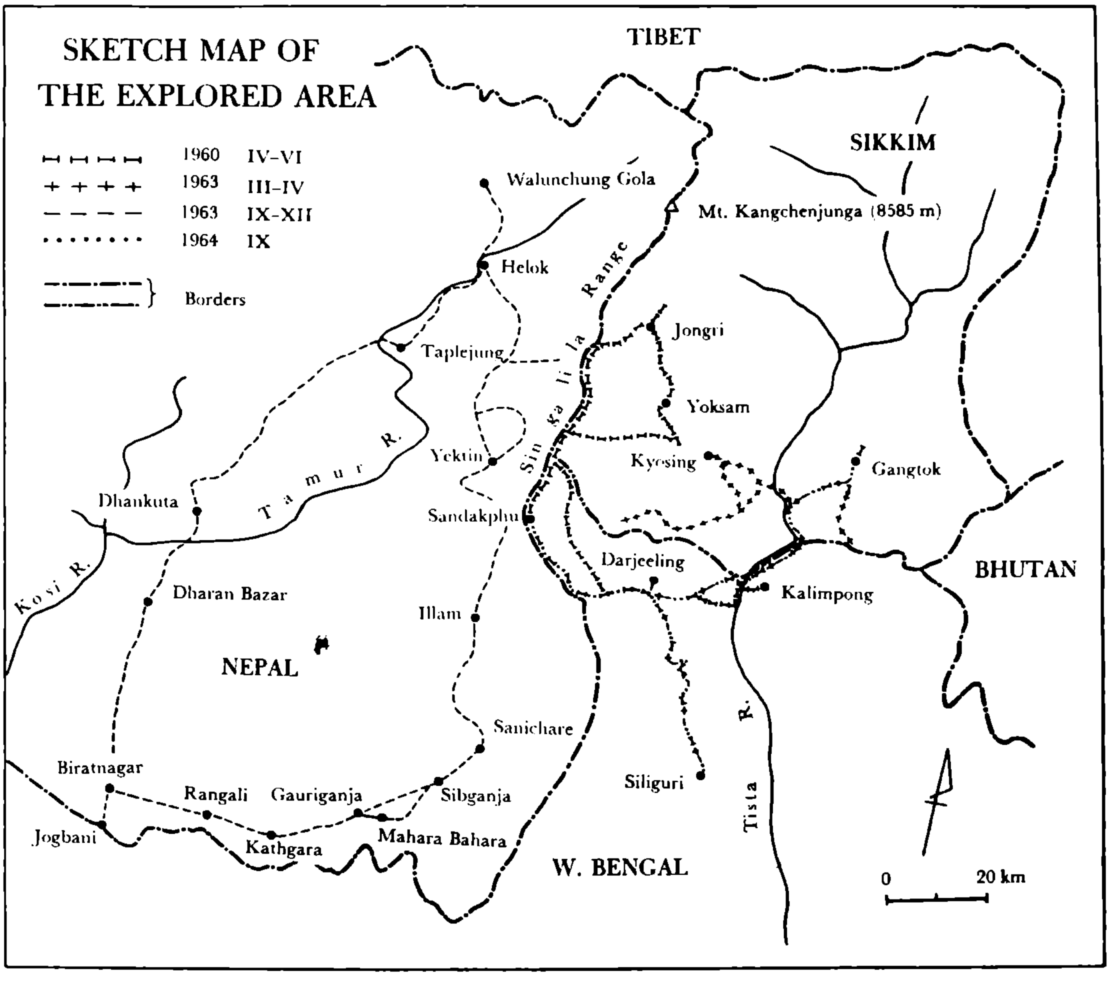


Fig. 2. Sketch map of the explored area.

April 1960				
21	*To*	Rayang	*Ha*	Rayang–Darjeeling
22		Rayang–Tista Bazar (300 m)–Kalimpong (1350 m)		Darjeeling (2100 m)
23		Kalimpong		Do.
24		Do.		Do.
25		Do.		Darjeeling–Gangtok (1650 m)
26		Kalimpong–Tista		Gangtok–Darjeeling
27		Tista–Peshok (900 m)		Darjeeling
28		Peshok–Lopchu (1500 m)		Do.
29		Lopchu–Darjeeling		Do.
			KaMuTu	Siliguri–Darjeeling
30	*HaKaMu ToTu*	Darjeeling		
May 1960				
1	*KaMuTo Tu*	Darjeeling–Mani Bhanjang (2000 m)–Batasi (2150 m)	*Ha*	Darjeeling (2100 m)
2		Batasi		Do.
3		Batasi–Deorali Danda (2500 m)–Palmajua (2300 m)		Do.
4		Palmajua		Do.
5		Palmajua–Lodhoma Khola (1400 m)–Rimbick (2200 m)		Do. (St. Paul Hill)
6		Rimbick		Do. (Birch Hill)
7		Rimbick–Siri Khola (1900 m)–Ramam (2400 m)		Darjeeling–Tonglu (3000 m)–Sandakphu (3600 m)
8		Ramam		Sandakphu–Phalut (3600 m)
9		Ramam–Kali Khola (2200 m)–Samanden (2400 m)–Phalut		Phalut
10	*HaKaMu ToTu*	Phalut (3600 m)		
11		Phalut–Mt. Singalila (3630 m)–Chia Bhanjang (3100 m)–Dentam (1450 m)		

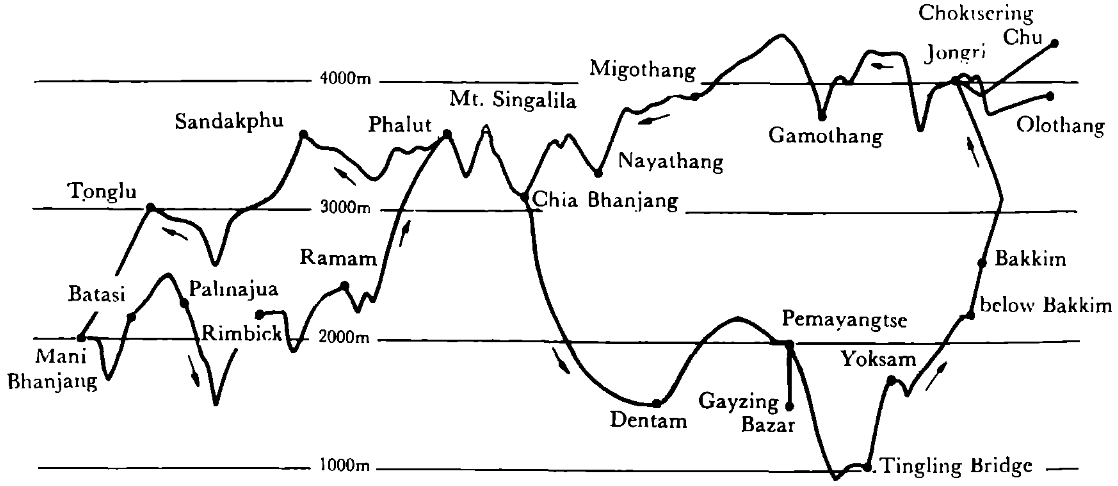


Fig. 3. Vertical route section of the first major trip in 1960.

May 1960				
12	*HaKaMu* *ToTu*	Dentam (1450 m)–Pemayangtse (Pamianchi) (2000 m)		
13		Pemayangtse–Gayzing Bazar (1550 m), and return		
14		Pemayangtse–Gayzing Bazar, and return		
15		Pemayangtse–Rimbi Chu (900 m)–Tingling Bridge (1000 m)		
16		Tingling Bridge–Yoksam (1700 m)		
17		Yoksam–Yoksam Monastry (1780 m), and return		
18		Yoksam–below Bakkim (2200 m)		
19	*HaKaMu*	below Bakkim–Jongri (4000 m)	*ToTu*	below Bakkim–Bakkim (2800 m)
20		Jongri (4000 m)		Bakkim–Jongri
21	*HaKaMu* *ToTu*	Do.		
22		Do. (3800-4000 m & Kabur 4200–3800 m)		
23	*HaMuTo* *Tu*	Jongri–Preig Chu (3600 m)–Olothang (3900 m), and return	*Ka*	Jongri
24	*HaKaMu* *ToTu*	Jongri		
25	*HaKaTu*	Do.	*MuTo*	Jongri–Choktsering Chu (4300 m), and return
26	*HaKaMu* *ToTu*	Jongri–Churong Chu (3600 m)–Panding (4200 m)–Gamothang		
27		Gamothang (3750 m)		
28		Do.		
29		Do.		
30		Gamothang–Oma La (4400 m)–Migothang (3900 m)		
31		Migothang		
June 1960				
1		Migothang–Nayathang (3300 m)		
2	*HaKaMu* *To*	Nayathang–Chia Bhanjang (3100 m)–Mt. Singalila (3630 m)–Phalut (3600 m)	*Tu*	Nayathang–Chia Bhanjang
3		Phalut (3600 m)		Chia Bhanjang–Mt. Singalila–Phalut
4	*HaKaMu* *ToTu*	Do.		
5		Do.		
6		Phalut–Sabargam (3300 m)–Sandakphu (3600 m)		
7		Sandakphu–Kala Pokhari (3000 m)–Garibans (2800 m)–Tonglu (3000 m)		
8		Tonglu–Mekma (2600 m)–Mani Bhanjang (2000 m)–Darjeeling		
9		Darjeeling (2150 m)		
10		Do.		
11		Do.		
12	*KaMuTu*	Do.	*HaTo*	Darjeeling–Gangtok (1650 m)
13		Darjeeling–Ghum (2300 m)–Tista Bazar (300 m)–Rangpo (350 m)–Gangtok		Gangtok
14	*HaKaMu* *ToTu*	Gangtok (1650 m)		

June 1960

15	*HaKaMu* *ToTu*	Gangotok (1650 m)		
16		Do. (Penlong La, 2100 m)		
17		Gangtok–Saramsa Medicinal Garden (1050 m), and return		
18		Gangtok–Rangpo–Tista Bazar–Ghum–Darjeeling		
19	*HaTu*	Darjeeling (2150 m)	*KaMuTo*	Darjeeling–Ghum–Tista Bazar–Kalimpong (1350 m)
20		Do.		Kalimpong–Tista Bazar–Ghum–Darjeeling
21	*HaKaMu* *ToTu*	Do.		
22	*HaKa*	Do.	*MuToTu*	Darjeeling–Sonada (2000 m), and return
23	*HaKaMu* *ToTu*	Darjeeling–Ghum–Senchal (2400 m)–Tiger Hill (2500 m), and return		
24		Darjeeling		
25		Do. (Happy Valley & Birch Hill)		
26		Do. (Jalapahar Valley)		
27	*KaMuTu*	Do.	*HaTo*	Darjeeling–Bagdogra (200 m)
28	*KaMu*	Do.	*Tu*	Darjeeling–Bagdogra
29		Darjeeling–Ghum–Kurseong–Siliguri (200 m)		

* * * * *

The First Minor Trip to Sikkim. March–April, 1963. (*Ha*)

March 1963

13	*Ha*	Darjeeling (2150 m) (Lloyd Botanic Garden)
14		Do. (Observatory Hill & St. Paul Hill)
15		Do.
16		Do. (Birch Hill, 2050 m)
17		Darjeeling–Tista Bazar (300 m)–Singtam (400 m)–Gangtok (1600 m)
18		Gangtok (Orchid Sanctuary, 1500 m & Penlong La, 2100 m)
19		Gangtok–Pakyong (1600 m)–Rhenok (1100 m), and return
20		Gangtok (1600 m)
21		Gangtok–Saramsa Medicinal Garden (1050 m), and return
22		Gangtok
23		Do.
24		Do.
25		Gangtok–Singtam (400 m)–Temi (1700 m)–Damthang (2100 m)–Temi
26		Temi (1700 m)–Damthang–Tendong Peak (2900 m), and return
27		Temi–Namchi (1700 m)–Naya Bazar (400 m)–Sombari (1300 m), and return
28		Temi–Damthang–Rabong La (2100 m)–Kyosing (1800 m)–Lower Road (1400–1000 m)–Temi
29		Temi–Singtam–Middle Camp (700 m)–Gangtok
30		Gangtok
31		Gangtok–Kalimpong (1350 m)–Darjeeling

April 1963

1	*Ha*	Darjeeling (Victoria Fall, 1950 m)		
2		Darjeeling–Senchal (2400 m)–Ghum (2300 m), and return		
3		Darjeeling (Birch Hill, 2050 m)		
4		Do. (Birch Hill)		
5		Darjeeling–Bagdogra (200 m)		

* * * * *

The Second Major Trip to East Nepal. September–December, 1963. (*Ha*, *Ka*, *Ku*, *Mu*, *To* & *Tu*)

September 1963

16	*HaKaKu*	Kathmandu (1400 m)		
17		Do.		
18		Kathmandu–Godavari (1600 m), and return		
19	*HaKu*	Kathmandu	*Ka*	Kathmandu–Thankot (1300 m), and return
20	*HaKaKu*	Kathmandu–Bodh Nath (1300 m)–Sunderijal (1500 m), and return		
21	*HaKu*	Kathmandu	*Ka*	Kathmandu–Chobar (1200 m), and return
22	*HaKaKu*	Kathmandu–Gokarna (1300 m), and return		
23		Kathmandu–Balaju (1300 m), and return	*Ka*	Kathmandu–Swayambhu Nath (1500 m), and return
24		Kathmandu–Kakani (2200 m), and return		
25		Kathmandu–Godavari (1600 m), and return		
26		Kathmandu		

October 1963

7	*HaKaKu*	Kathmandu		
8		Do.		
9		Kathmandu–Pouwa (1600 m), and return		
10		Kathmandu–Biratnagar (200 m)		
11		Biratnagar (200 m)		
12		Do.		
13		Do.	*MuToTu*	Kathmandu
14		Do.		Kathmandu–Biratnagar
15	*HaKaKu MuToTu*	Biratnagar		
16		Biratnagar–Phusri (450 m)–Sanguri Bhanjang (1200 m)–Dhara Pani (900 m)		
17	*HaKaKu MuTo*	Dhara Pani–Tamur Bridge (300 m)–Dhankuta (1200 m)	*Tu*	Dhara Pani–Tamur Bridge
18		Dhankuta (1200 m)		Tamur Bridge–Dhankuta
19	*HaKaKu MuToTu*	Dhankuta		
20		Do.		
21		Do.		
22	*HaKaKu Mu*	Do.	*ToTu*	Dhankuta–Hilay (1800 m)–Murhay (2000 m)
23		Dhankuta–Hilay–Murhay		Murhay–Sinduwa (2100 m)

October 1963

24	*HaKaKu Mu*	Murhay–Sinduwa–Chitray (2150 m)–Bilbatay Bhanjang (2200 m)	*ToTu*	Sinduwa–Bilbatay Bhanjang
25	*HaKaKu MuToTu*	Bilbatay Bhanjang (2200 m)		
26		Do.	*Ha*	Bilbatay Bhanjang–above Tutay (2600 m), and return
27		Bilbatay Bhanjang–Tutay (2400 m)–Tinjuray (2900 m)–Hati Sar (2700 m)		

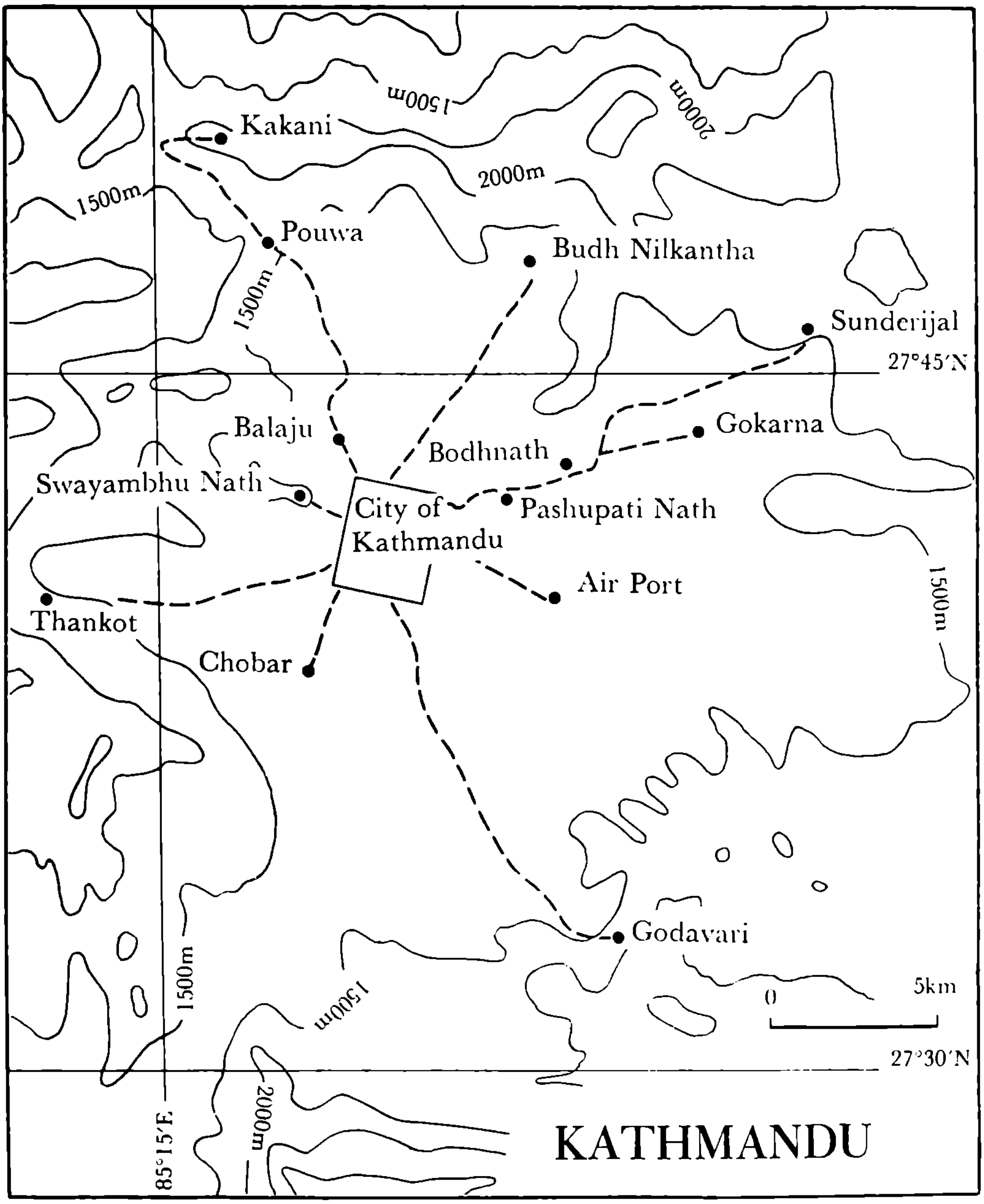


Fig. 4. Kathmandu.

October 1963

28	*HaKaKu MuToTu*	Hati Sar–Mangalbare (2600 m)–Lam Pokhari (2900 m)–Minchin Dhap (2900 m)		
29		Minchin Dhap–Mul Pokhari (2500 m)		
30		Mul Pokhari–Gorzu Kosir (2100 m)–Nissim (1500 m)–Dumhan (700 m)		
31	*HaKuTu*	Dumhan–Taplejung (2000 m)	*KaMuTo*	Dumhan

November 1963

1		Taplejung		Dumhan–Taplejung
2		Do.		
3	*HaKaKu MuToTu*	Taplejung–Heydewa (2000 m)–Garhi Danra (2200 m)		
4		Garhi Danra–Linkhim (1600 m)–Tuwa (1800 m)		
5		Tuwa–Kiwa (1500 m)–Taplethok (1400 m)		
6		Taplethok–Helok (1500 m)		
7		Helok		
8	*HaKuTu*	Do. (1500–1600 m)	*KaMuTo*	Helok–Iladanda (1800 m)
9		Do.		Iladanda–Selap (2600 m)
	Tu	Helok–above Lelep (2600 m), and return		
10		Helok–Baroya Khimty (2500 m)		Selap–Walunchung Gola (3500 m)
11		Baroya Khimty		Walunchung Gola–Zongi (2800 m)
12		Baroya Khimty–Thakma Khola (3200 m)		Zongi–Iladanda
13		Thakma Khola		Iladanda–Helok
14		Thakma Khola–Diorali Bhanjang (3500 m)–Bhandukay (2500 m)		Helok
15		Bhandukay		Helok–Baroya Khimty
16		Bhandukay–Yamphodin (2100 m)–Ghatte (1600 m)		Baroya Khimty–Thakma Khola
17		Ghatte (1600 m)		Thakma Khola–Diorali Bhanjang–Yamphodin
18		Do.		Yamphodin–Ghatte
19	*HaKaKu MuToTu*	Ghatte-2400 m–Khebang (1700 m)		
20	*HaKaKu MuTo*	Khebang–below Siling Tzokupa (2100 m)	*Tu*	Khebang (1700 m)
21		below Siling Tzokupa–Siling Tzokupa (3800 m), and return		Do.
22		below Siling Tzokupa–Khebang		Do.
23	*HaKaKu MuToTu*	Khebang		
24		Khebang (1700 m)–Bharomdin (1000 m)		
25		Bharomdin–Tharpu (1200 m)		
26	*HaKuTu*	Tharpu	*KaMuTo*	Tharpu–near Chyangthaphu (1100 m)

November 1963

27	*HaKuTu*	Tharpu–Kaulepati Bhanjang (2700 m)–Khunga (2000 m)	*KaMuTo*	near Chyangthaphu–Chyangthaphu(1200 m)–Birwa (2400 m)
28		Khunga–Yektin (1700 m)–below Yektin (1400 m)		Birwa–2800 m–Yektin–below Yektin
29	*HaKaKu* *MuToTu*	below Yektin		
30		below Yektin–Akasay (2300 m)–Batasay (2400 m)		

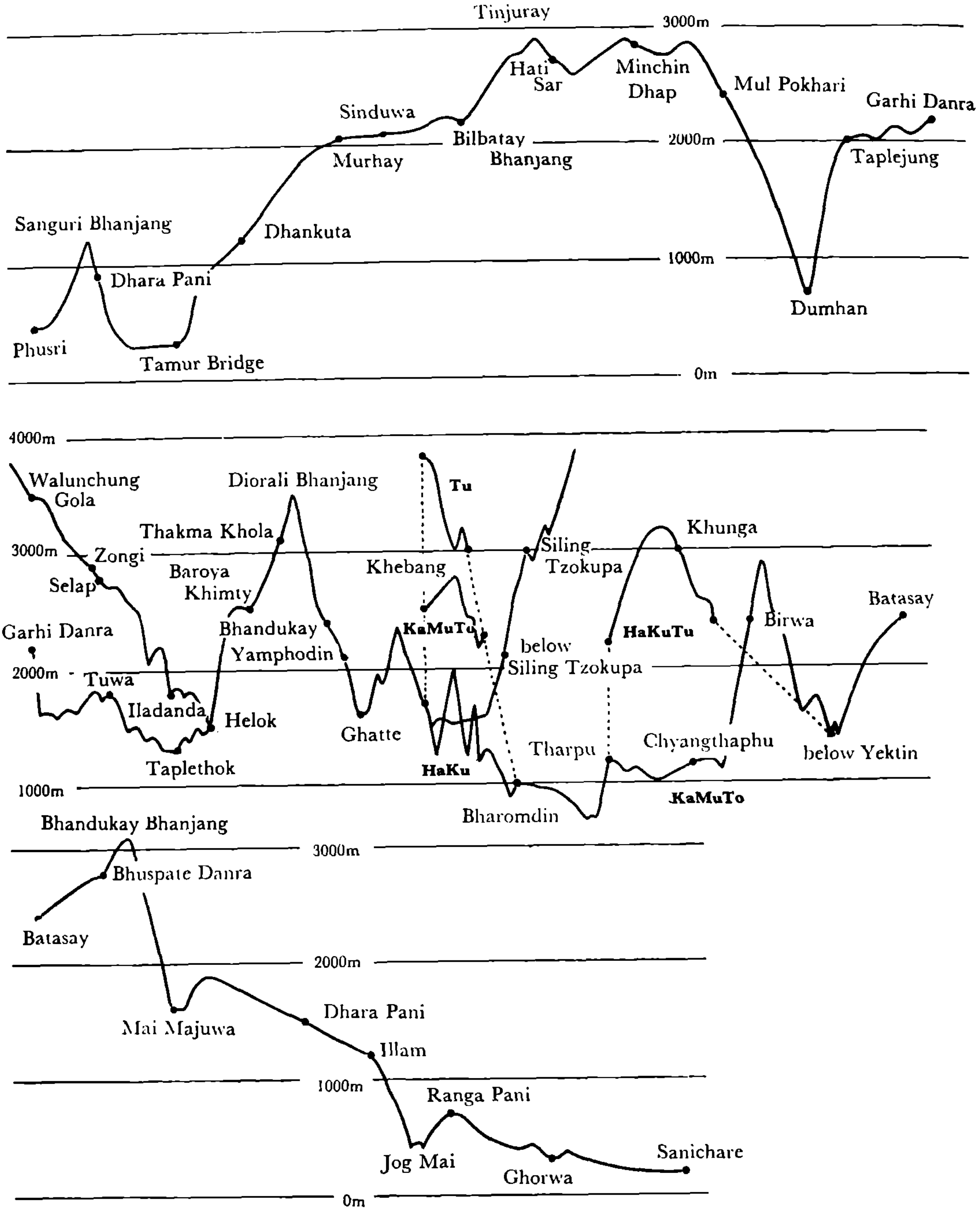


Fig. 5. Vertical route section of the second major trip in 1963.

December 1963

1	*HaKaKu MuToTu*	Batasay–Halhale Bhanjang (2700 m)–Bhuspate Danra (2800 m)						
2		Bhuspate Danra (2800 m)						
3		Bhuspate Danra–Bhandukay Bhanjang (3100 m)–below Mai Majuwa (1600 m)						
4		below Mai Majuwa–Mai Pokhari (1600 m)–Dhara Pani (1500 m)						
5		Dhara Pani–Illam (1200 m)						
6		Illam						
7		Do.						
8		Illam–Jog Mai (400 m)–Ranga Pani (700 m)						
9	*HaKaKu MuTo*	Ranga Pani–Chisa Pani (600 m)–Loohya Mai (400 m)–Ghorwa (300 m)			*Tu*	Ranga Pani–Sanichare (200 m)		
10		Ghorwa–Sanichare (200 m)				Sanichare		
11	*HaKaKu MuToTu*	Sanichare–Sibganja (200 m)						
12	*HaKaKu Tu*	Sibganja–Gauriganja			*MuTo*	Sibganja–Mahara Bahara (200 m)		
13	*HaKuTu*	Gauriganja–Rangali (200 m)				Mahara Bahara–Gauriganja–Kathgara (200 m)		
					Ka	Gauriganja–Kathgara		
14		Rangali–Biratnagar			*KaMuTo*	Kathgara–Rangali		
15		Biratnagar (200 m)				Rangali–Biratnagar		
16	*HaKaKu MuToTu*	Do.						
17		Do.						
18		Do.						
19	*KaMuTo Tu*	Do.			*HaKu*	Biratnagar–Calcutta		
20		Do.						
21	*KaMuTo*	Do.			*Tu*	Biratnagar–Kathmandu (1400 m)		
22		Do.				Kathmandu		
23		Do.				Do.	*HaKu*	Darjeeling
24		Do.				Do.		Do.
25	*Ka*	Do.	*MuTo*	Biratnagar–Kathmandu		Kathmandu–Pokhara		Do.
26		Do.		Kathmandu		Pokhara–Kathmandu		Do.
27		Biratnagar–Kathmandu			*MuToTu*	Kathmandu		Do. (Senchal-Ghum)
28	*KaMuTo Tu*	Kathmandu–Budh Nilkantha (1400 m)–Balaju (1300 m)–Pashupati Nath (1300 m)–Gokarna (1300 m), and return						Do. (Birch Hill)
29	*KaTu*	Kathmandu			*MuTo*	Kathmandu–Calcutta		Do.
30		Kathmandu–Patna						Do.
31								Do.

* * * * *

The Second Minor Trip to Darjeeling and Gangtok. September 1964. (*Ha*)

September 1964		
10	*Ha*	Darjeeling (2150 m)
11		Do. (Lloyd Botanic Garden)
12		Darjeeling–Rangpo (350 m)–Namli (900 m)–Gangtok (Zalipur, 1000 m)
13		Gangtok (1650 m) (Lagyap, 2000–2300 m & Penlong La, 2100 m, Mr. K. C. Pradhan)
14		Gangtok–Darjeeling
15		Darjeeling
16		Darjeeling–Mani Bhanjang (2000 m)–Tonglu (3000 m)–Garibans (2800 m)–Sandakphu (3600 m)
17		Sandakphu–Garibans–Tonglu–Darjeeling
18		Darjeeling
19		Darjeeling–Senchal (2400 m)–Ghum (2300 m), and return
20		Darjeeling
21		Do. (Birch Hill, 2050 m)
22		Do.
23		Darjeeling–Bagdogra (200 m)

PHYTOGEOGRAPHY OF EASTERN HIMALAYA, WITH SPECIAL REFERENCE TO THE RELATIONSHIP BETWEEN HIMALAYA AND JAPAN

by Hiroo Kanai

PHYSIOGRAPHY

In the eastern part of the Great Himalayan Range, at the border of Nepal and Sikkim, the Singalila Range rises from Mt. Kangchenjunga (8585 m alt.) and runs southward for about 100 km to the northern fringe of the Gangetic Plain. The eastern, Sikkim side of the Singalila Range is the valley of the Tista River, and the western, East Nepal side the valley of the Tamur River, one of the tributaries of the Kosi River. The physiography and the flora of both the eastern and the western sides of the Singalila Range are similar to each other.

The mountain region is deeply cut by V-shaped valleys, giving the landscape a steep topography. In the northern part of the region, there are glaciated highlands topped by perpetually snow-covered mountains, a vast flood plain extends across the southern part of the region and forms the northernmost area of the Gangetic Plain.

The region explored is located between the latitudes of 26°30′N and 27°45′N and the longitudes of 87°15′E and 89°00′E; extending from 200 to 4500 m above sea level, including from tropical to alpine vegetations.

CLIMATIC CONDITIONS

Located between the tropical Gangetic Plain and the subalpine Tibetan Plateau, the region has an intermediate climate pattern, though there is considerable variation due to the great altitudinal difference within a small area.

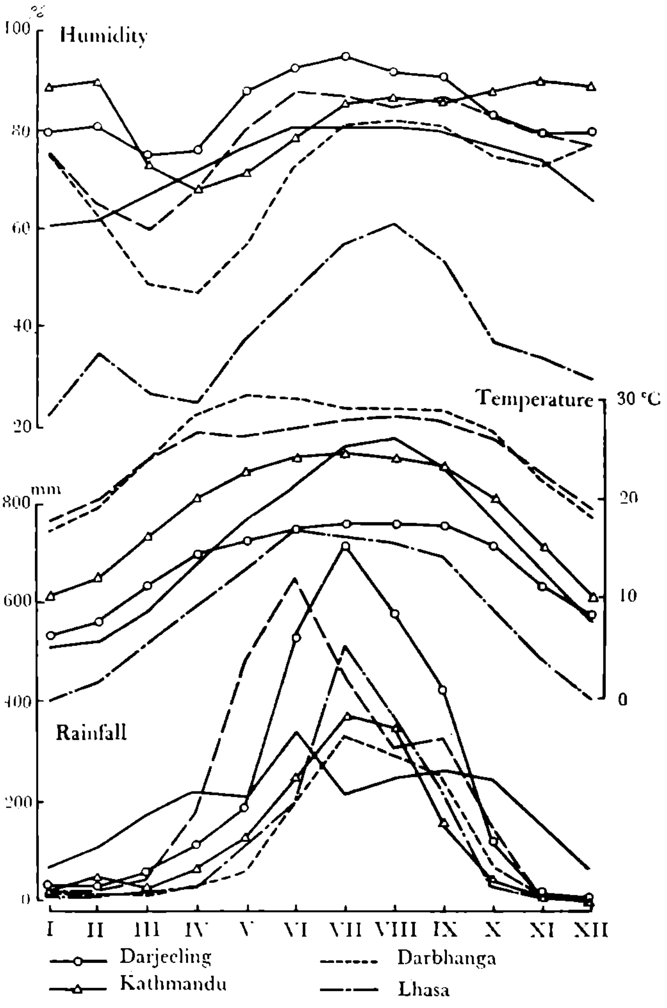


Fig. 6. Climatic data.

Darjeeling and Kathmandu are cooler than the Gangetic

Table 1. Climatic Data.

	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	Annual
	Darjeeling 27°03′N 88°16′E 2127 m alt.												
Temperature (°C)	6.4	7.7	11.2	14.3	15.7	17.0	17.5	17.5	17.2	15.1	11.3	8.1	13.3
Rainfall (mm)	22	27	53	109	187	522	713	573	419	116	14	5	2760
Humidity (%)	80	81	75	76	88	93	95	92	91	83	79	79	84
	Kathmandu 27°42′N 85°12′E 1337 m alt.												
Temperature (°C)	10.2	12.2	16.3	20.1	22.7	24.3	24.6	24.3	23.4	20.1	15.1	11.1	18.7
Rainfall (mm)	15	41	23	58	122	246	373	345	155	38	8	3	1428
Humidity (%)	89	90	73	68	72	79	86	87	86	88	90	89	83
	Dhubri 26°01′N 89°59′E 35 m alt.												
Temperature (°C)	17.7	19.8	24.1	26.6	26.4	27.2	28.1	28.3	27.8	26.1	22.3	18.9	24.4
Rainfall (mm)	11	19	45	171	481	644	448	305	328	145	12	1	2610
Humidity (%)	75	65	60	68	81	88	87	85	87	83	79	77	78
	Darbhanga 26°10′N 85°54′E 49 m alt.												
Temperature (°C)	16.8	19.1	24.0	28.7	30.5	30.3	29.3	29.3	29.0	26.8	21.9	18.0	25.3
Rainfall (mm)	20	14	10	25	57	190	330	291	247	70	7	2	1258
Humidity (%)	76	63	49	47	57	73	81	82	81	75	73	77	69
	Lhasa 29°43′N 91°02′E 3658 m alt.												
Temperature (°C)	–0.3	1.6	5.5	9.1	13.0	17.0	16.4	15.6	14.3	9.2	3.9	0.0	8.8
Rainfall (mm)	0.1	4	13	22	107	196	511	369	215	25	0.6	0.1	1463
Humidity (%)	22	35	27	25	38	48	57	61	54	37	34	30	39
	Shizuoka 34°58′N 138°24′E 14.9 m alt.												
Temperature (°C)	5.2	5.7	8.6	13.3	17.7	21.4	25.4	26.1	23.3	17.7	12.8	7.6	15.4
Rainfall (mm)	61	100	167	213	219	333	216	246	261	247	156	69	2278
Humidity (%)	61	62	67	72	77	81	81	81	80	77	74	66	73

Plain and warmer than the Tibetan Plateau: the annual mean temperatures of Darjeeling and Kathmandu are 13.3°C and 18.7°C while those of Darbhanga and Dhubri, both located in the adjacent plain region, are 25.3°C and 24.4°C; the temperature of Lhasa is 8.8°C. (Tab. 1 and Fig. 6).

Regional difference in rainfall—lowland, mountain, and highland—are slight. Annual precipitation and also its monthly fluctuation indicate the degree of monsoon influence, stronger in the east and weaker in the west. Rainfall is greatest in summer and least, sometimes almost nil, in winter.

Atmospheric humidity in Darjeeling and Kathmandu is higher than in the lowlands and highlands, especially in winter. Mist caused by the southern wind blowing against the mountain slopes is supposed to be responsible for the high humidity, although the atmosphere is not cloudy in winter.

Thus, moderate temperature, sufficient atmospheric humidity, and sufficient monsoon rainfall produce a mesophytic climatic condition in the middle elevation of the Himalayan Range.

Surrounded by the sea, the Japanese Archipelago is favoured by a temperate mesophytic climate. The author selected Shizuoka, southwest of Tokyo on the Pacific Ocean, for a comparison of Himalayan and Japanese climatic conditions; Shizuoka's annual mean temperature and rainfall lie midway between those of Kathmandu and Darjeeling, and the pattern of annual fluctuation in rainfall is similar.

The annual mean temperature of Shizuoka is 15.4°C, almost the same as that of Himalaya, but the annual range 20.9°C is much larger than the 11.1°C and 14.6°C ranges of Darjeeling and Kathmandu. The annual range of rainfall at Shizuoka is comparatively small with a maximum in June of 333 mm and a minimum in January of 61 mm. While it is greater in Himalaya, the maximum is 375 mm in July and the minimum is 3 mm in December at Kathmandu, and the maximum is 713 mm in July, and the minimum is 5 mm in December at Darjeeling. In terms of humidity, Shizuoka is much drier than the Himalayan region. The annual mean humidity of Shizuoka is 73 per cent, and of Kathmandu and Darjeeling 83 per cent and 84 per cent. It is noteworthy that Shizuoka has a relatively low humidity in winter in spite of considerable rainfall, while Darjeeling and Kathmandu, with almost no rainfall, have a relatively higher humidity.

Japan's climatic conditions are similar to those of Himalaya, but differ in detail.

Himalayan plants transplanted in Japan have not fared well in some cases. Bitten by frost and dried by the wind in winter, the plants are weakened by summer heat and other atmospheric factors and attacked by pests.

The flowering season is different for some Japano-Himalayan corresponding plants. *Corylus ferox*, *Prunus cerasoides*, *Brassica Rapa*, and *Alnus nepalensis* bloom from October to December in Himalaya while their Japanese counterparts bloom in the spring. Accumulated physiological adaptation to different environments during the course of evolution is the probable explanation for this phenomenon.

FOREST TYPES OF EASTERN HIMALAYA

1) Rain-green Deciduous Forest

The northern fringe of the Gangetic Plain and the Himalayan foothills to an altitude of 700–900 m are covered with a tropical rain-green deciduous forest, consists of many kinds of deciduous trees dominated by *Shorea robusta*. (Pl. 9 a)

The species associated with this zone are as follows.

Trees: *Tectona grandis*, *Adina cordifolia*, *Terminalia tomentosa*, *Lagerstroemia parviflora*, *Dillenia indica*, *Bauhinia malabarica*, *Dalbergia Sisso*, *Anogeissus latifolia*, *Syzygium Wallichii*, *Phoebe lanceolata*, *Ficus hispida*, *Semecarpus anacardium*, *Sloanea sterculiaceus*, *Bombax malabaricum*, *Quercus lanceaefolia*, *Cassia Fistula*, *Mallotus philippinensis*, *M. albus*, *Litsea salicifolia*, *L. polyantha*, *Randia longispina*, *Dalbergia* spp., *Albizia* spp.

Shrubs and herbs: *Mussaenda angustifolia*, *M. Roxburghii*, *Butea minor*, *Zizyphus mauritiana* (in open places), *Clerodendrum* spp., *Begonia megaptera*, *B. nepalensis*, *Maesa montana*, *Blumea lacera*, *Barleria strigosa*, *Hygrophila polysperma*, *Phlogacanthus thyrsiflorus*.

The following species are found in this and the next higher zones.

Bauhinia purpurea, *Oroxylum indicum*, *Callicarpa arborea*, *C. macrophylla*, *C. vestita*, *Holmskioldia sanguinea*, *Eupatorium odoratum* (in open places), *Strobilanthes capitatus* (up to the *Castanopsis* zone).

South of Ghorwa, 350 m alt., the following species are found.

Canopy: *Shorea robusta* (dominant), *Mallotus albus*, *Bauhinia malabarica*, *Tectona grandis*, *Lagerstroemia parviflora.*

Shrub: *Clerodendrum infortunatum*, *Leea umbraculifera*, *Zizyphus mauritiana*, *Xeromphis spinosa*, *Cycas pectinata*, *Ficus hispida*, *Butea minor.*

Liana: *Bauhinia Vahlii*, *Holmskioldia sanguinea*, *Dioscorea* sp., *Lygodium flexuosum*, *Hoya* sp., *Smilax ovalifolia.*

Duabanga sonneratioides and *Dendrocalamus* sp. occur in humid soil and *Pandanus* by shady streams.

In this zone, most of the level ground is covered with rice and jute paddies. Such shrubs as *Zizyphus mauritiana* (Pl. 9 b), *Lantana Camara*, and *Eupatorium odoratum* form thickets on sunny roadsides. *Ficus religiosa*, *Artocarpus integra* and *Musa paradisiaca* are planted everywhere.

2) Mixed Broadleaved Forest

Subtropical mixed broadleaved forests prevail to an elevation of 1500–1700 m. The dominant tree species are *Castanopsis indica* and *Schima Wallichii.*

Other species associated with this zone are as follows.

Trees: *Ficus drupacea* var. *pubescens*, *Engelhardtia spicata*, *Michelia Kisopa*, *Albizia Gamblei*, *Erythrina variegata*, *Euonymus Hamiltonianus*, *Quercus acutissima*, *Q. glauca*, *Lindera bifaria*, *Litsea oblonga*, *Phoebe paniculata*, *Brassaiopsis Hainla*, *Diploknema butyracea.*

Shrubs and herbs: *Sarcococca coriacea*, *Melastoma normale*, *Schefflera venulosa*, *Saurauja napaulensis*, *Maesa Chisia*, *M. macrophylla*, *Mussaenda Treutlei*, *Begonia* spp., *Peristrophe speciosa*, *Cassia mimosoides.*

Zizyphus incurva and *Barleria dichotoma* seem to be indicative species of this zone.

Crotalaria spp. are common in grazing ground. *Eupatorium odoratum* occurs in open or recently denuded places. Many species of *Begonia* are found in shady humid places.

The following species are commonly found in this and the next higher zones.

Alnus nepalensis, *Litsea citrina*, *Maesa rugosa*, *Osbeckia stellata*, *Senecio densiflorus*, *Arisaema speciosum*, *A. tortuosum*, *Remusatia Hookeriana*, *Justicia procumbens* var. *simplex*, *Thunbergia coccinea.*

Between Tharpu and Chyangthaphu, 1200 m alt., the following plants are observed.

Schima Wallichii, *Castanopsis indica*, *Terminalia myriocarpa*, *Phyllanthus Embrica*, *Zizyphus incurva*, *Callicarpa arborea*, *Bauhinia purpurea*, *Mallotus philippinensis*, *Maesa rugosa*, *Erythrina variegata*, *Rhus succedanea*, *Trichosanthes Wallichiana.*

The upper part of this zone overlaps with the lower part of the next Evergreen Oak zone, between 1700 m and 2000 m alt.

A sparse forest of *Quercus incana* is present only on steep, rocky, and south-faced slopes. It is observed sporadically from 1300 m to 2500 m alt.

The natural vegetation of this zone has been largely destroyed by cultivation and grazing.

3) Evergreen Oak Forest

A temperate laurel forest composed of evergreen oaks and lauraceous species occurs in the middle elevation of the mountain region, up to 2500 m–2800 m. (Pl. 10 a) The following species are found throughout this zone.

Photinia integrifolia, *Lindera Neersiana*, *Quercus spicata*, *Rhododendron arboreum*, *Rh. lepidotum* (in open places), *Symplocos phyllocalyx*, *S. ramosissima*, *Randia tetrasperma*, *Acer Campbellii*, *Euonymus vagans*, *Brassaiopsis mitis*, *Pentapanax Leschenaulthi*, *Corylus ferox*, *Edgeworthia Gardneri*, *Lyonia ovalifolia*, *Vaccinium vacciniaceum*, *Anaphalis triplinervis*, *Arisaema concinnum* and var. *alienatum*, *A. consanguineum*, *Viburnum erubescens* (up to the middle elevation of the *Rhododendron* zone, usually in open places).

Symplocos spp. and *Rhododendron arboreum* are dominant in some places. *Lyonia ovalifolia* and *Mahonia napaulensis* are sometimes dominant as a secondary layer.

Edgeworthia Gardneri and *Acer Campbellii* are indicative species of this zone.

Within this zone, there are two principal sub-zones. *Castanopsis* predominates up to an elevation of 2100–2300 m, and *Quercus* above it to 2500–2800 m alt.

In the *Castanopsis* zone, *Castanopsis Hystrix* and *C. tribuloides* (Pl. 10 b) dominate. *Quercus fenestrata*, *Machilus Duthiei*, *M. edulis*, *Cinnamomum glanduliferum*, *C. obtusifolium**, *Actinodaphne reticulata*, *A. sikkimensis*, and *Symplocos theaefolia* are the subordinates.

Other species associated with this zone are as follows:

Ficus auriculata, *F. sarmentosa*, *Ilex insignis*, *Betula alnoides*, *Elaeocarpus Ganitrus*, *Michelia Doltsopa*, *Prunus cerasoides**, *P. napaulensis*, *Acer oblongum*, *Neillia thyrsiflora*, *Dichroa fabrifuga*, *Rubus ellipticus** (in cultivated regions), *Eurya acuminata*, *E. cerasifolia*, *Osbeckia sikkimensis**, *Oxyspora paniculata** (in open places), *Gaultheria fragrantissima**, *Jasminum dispermum*, *Viburnum coriaceum*, *Anaphalis Busua**, *Gynula Cusimbua**, *Strobilanthes urophyllus* var. *sikkimensis*, *Rhododendron Griffithianum*, *Symingtonia populnea*, *Dicliptera Roxburghiana**.

At Murhay, 2000 m alt., the following species are observed:

Castanopsis Hystrix (dominant), *Mahonia napaulensis* (subordinate), *Symplocos theaefolia* (subordinate), *Daphne Bholua*, *Potentilla fruticosa*, *Viburnum erubescens*, *Lyonia ovalifolia*, *Sarcococca Wallichii*, *Impatiens* spp., *Selaginella* sp., *Sanicula elata*, *Ainsliaea latifolia*, *Begonia Josephi*, *Cayratia japonica*, *Hedera nepalensis*.

Epiphytic flowering plants, ferns, and mosses are luxuriant on rocks and trunks of trees.

The lower limit of the *Castanopsis* zone is probably 1500–1700 alt.; most of the zone has been cultivated.

In the *Quercus* zone *Quercus lamellosa*, *Q. lineata*, *Q. pachyphylla*, *Q. semecarpifolia*, *Lindera assamica*, *L. pulcherrima*, *Litsea elongata*, *Ilex fragilis*, *I. intricata*, *Symplocos glomerata*, and *S. pirifolia* dominate.

Other species associated with this zone are *Magnolia Campbellii*, *Lindera heterophylla*, *Euonymus frigidus*, *E. viburnoides*, *Osmanthus suavis*, *Sorbus rhamnoides*, *Gaultheria Griffithiana*, *G. semiinfera*, *Pieris formosa* (dominant in some places), *Ligustrum confusum*,

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* Indicative species of this zone.

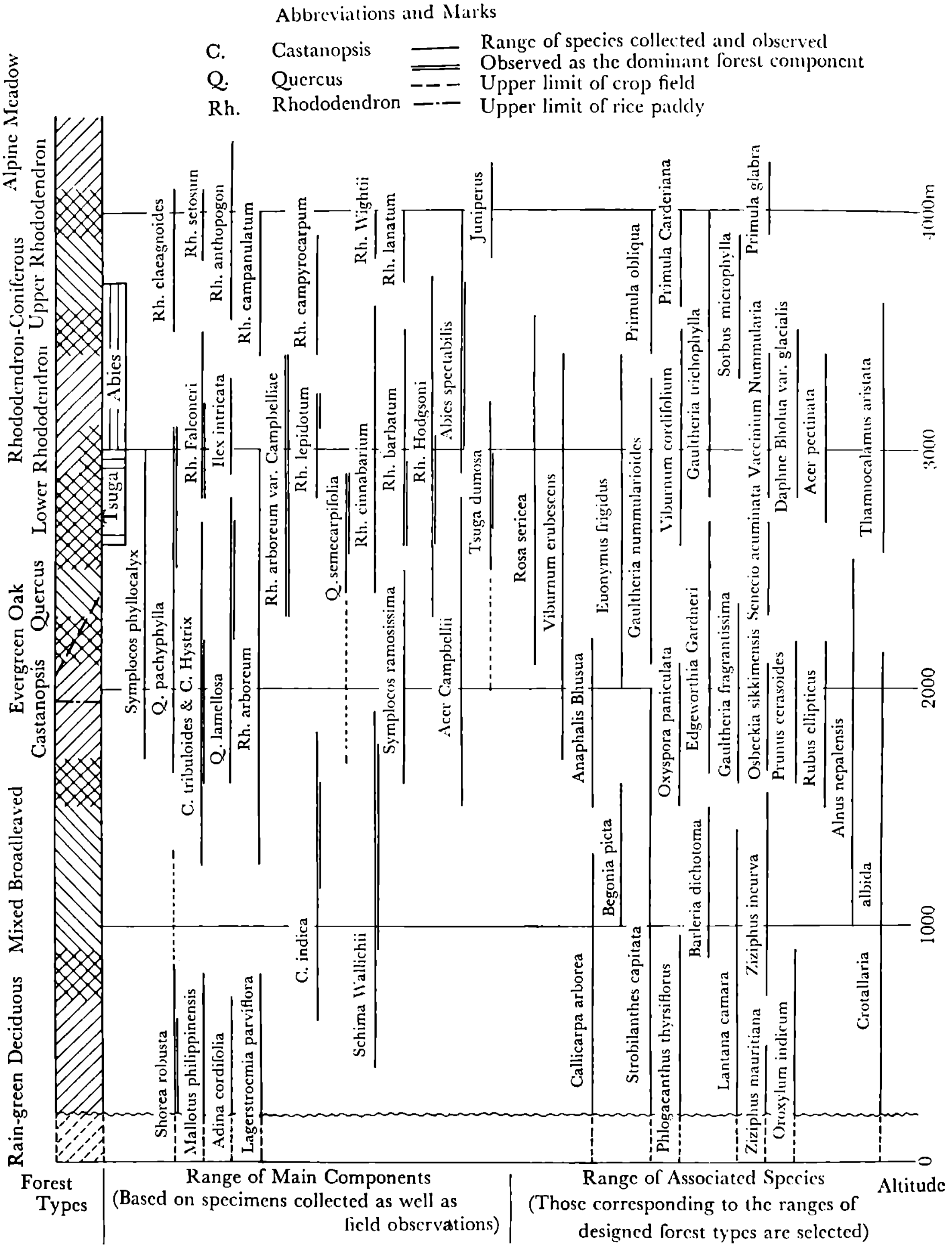

Fig. 7. Forest types and their components of the Singalila Range.

Viburnum Mullaha, *Begonia Josephi*, *Ainsliaea aptera*, *Anaphalis margaritacea* (invaded into both upper and lower zones), *Senecio* spp., *Arisaema Griffithii*, *Sarcococca Hookeriana*, and *S. Wallichii*. *Senecio acuminatus* is an indicative species of this zone.

Q. pachyphylla (Pl. 10 c) and *Q. semecarpifolia* form pure stands, the former on the northern and somewhat humid slope and the latter on the southern and arid slope, and they are sometimes found up to 2900–3000 m alt. A forest of *Q. semecarpifolia* (Pl. 2 b) without any other principal component is found on the sunny and arid southern slope of the mountain ridge running east to west at an altitude of 2500–2600 m between Batasay and Bhuspate Danra; while a pure *Q. pachyphylla* forest with a few *Pieris formosa* is found on the shady and humid northern slope of the same ridge.

In Japan, evergreen oaks are important components of the evergreen broadleaved forest which accounts for lower vegetation from northern Honshu southward; the forest is composed of *Castanopsis Sieboldii*, *Quercus acuta*, *Q. glauca*, *Q. salicina*, *Machilus Thunbergii*, *Cinnamomum japonicum*, etc.

4) Rhododendron Coniferous Forest

Rhododendron, as an individual tree, is found even at an elevation of 1200 m in a mixed broadleaved forest; the species is *Rh. arboreum*. Scattered here and there, it does not form a forest. The forest of *Rhododendron* is seen above 2500 m alt. and continues to the timber line, 4000 m alt., although it has been replaced by a coniferous forest in some places. The size of the trees is sometimes 1.5 m in diameter at chest height and reaches 15 m in height. (Pl. 13 b)

The Lower Rhododendron zone is composed of *Rh. arboreum* var. *Campbelliae*, *Rh. barbatum*, *Rh. Hodgsoni*, *Rh. grande*, *Rh. lepidotum*, *Rh. Thomsonii*, *Rh. cinnabarium*, and *Rh. Falconeri* (upper part). Other associated species are; *Prunus undulata*, *Acer caudatum*, *A. pectinatum**, *A. sterculiaceum*, *Brassaiopsis alpina*, *Schefflera impressa*, *Viburnum cordifolium**, *Sorbus foliolosa*, *S. Hedlundi*, *Vaccinium Nummularia**, *Primula petiolaris*, *Strobilanthes glutinosus* (lower part), and *Daphne Bholua* var. *glacialis**.

Berberis spp. are found in abundance on grazing ground of this and the next lower zones. (Pl. 11 a)

In the Upper Rhododendron zone, *Rh. campanulatum*, *Rh. campylocarpum*, *Rh. lanatum*, and *Rh. Wightii* dominate up to the timber line. *Rh. anthopogon*, *Rh. setosum*, and *Rh. elaeagnoides* are found in open places especially on the margin of the timber line. *Prunus rufa*, *Sorbus microphylla*, and *Gaultheria pyroloides* are associated, the last is growing in shady forest. *Primula Calderiana*, *P. capitata* and subsp. *crispata*, *P. denticulata*, *P. gracilipes*, *P. obliqua*, *Arisaema biflagellatum*, *A. Jacquemonti*, and *A. ostiolatum* are found in open places.

Betula utilis, *Sorbus ursina*, *Gaultheria trichophylla*, and *Arisaema Wallichianum* var. *sikkimense* are found throughout the *Rhododendron* zone.

Cotoneaster spp. are found on open mountain ridges. Epiphytic mosses and lichens are luxuriant on the trees. The constituents of the Rhododendron forest are exemplified as follows.

a) Between Tinjuray and Hati Sar, 2900 m alt.

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* Indicative species of this zone.

Rh. arboreum var. *Campbelliae* (dominant), *Abies spectabilis* (rare), *Lyonia ovalifolia* (abundant), *Rosa sericea* (abundant), *Rh. barbatum*, *Rh. lepidotum*, *Spiraea micrantha*, *Leucosceptrum canum*, *Lindera Neesiana*, *Enkianthus deflexus*, *Viburnum Mullaha*, *Daphne Bholua*.

b) Siling Tzokupa, 3000 m alt.

Rh. Falconeri (dominant), *Rh. Hodgsoni* (dominant), *Rh. arboreum* var. *Campbelliae* (abundant), *Rh. barbatum* (abundant), *Rh. ciliatum*, *Rh. lepidotum*, *Potentilla Kleiniana*, *Rosa sericea*, *Rubus nutantiflorus*, *R. splendidissimus*, *Viburnum coriaceum*, *Leycesteria formosa*, *Thamnocalamus aristatus*, *Anaphalis margaritacea*, *Lyonia ovalifolia*, *Fragaria* sp., *Acer pectinatum*.

The coniferous forest is composed of only two species, *Abies spectabilis* and *Tsuga dumosa*, and is usually accompanied by *Rhododendron* which forms the secondary layer in the forest. *Tsuga* occurs at a lower and *Abies* at an upper altitude. (Pl. 2 a & 13 a)

Although the coniferous forest is abundant in some places, it does not compose a continuous vegetational zone in this region.

Coniferous forest has been observed in the following places.

c) Above Ramam
Tsuga (pure stand) 2600 m alt.
d) Between Ramam and Phalut
Tsuga mixed with *Rhododendron* 2600–2800 m alt.
Abies with *Rhododendron* 3100–3600 m alt.
e) Between Phalut and Sandakphu
Abies with *Rhododendron* 3600–2800 m alt.
f) Between Bakkim and Jongri
Tsuga with *Abies* 3100–3200 m alt.
Abies 3200–3400 m alt.
Rhododendron, *Abies* 3400–3600 m alt.
g) Gamothang
Rhododendron, *Abies* 3800 m alt.
h) Selap and above
Quercus with *Tsuga* 2600–2700 m alt.
Tsuga, *Rhododendron arboreum*, *Pieris formosa* 2700–2800 m alt.
i) Above Walunchung Gola
Abies (dominant), *Rhododendron* spp., *Juniperus*, *Berberis Hookeri*, *B. insignis*, *B. umbellata*, *Betula utilis* 3500 m alt.
j) Thakma Khola
Tsuga (dominant), *Rh. arboreum* var. *Campbelliae*, *Arundinaria Maling*, *Daphne Bholua*, *Rh. Falconeri* 2800–3000 m alt.
Abies (dominant), *Tsuga* (scarce), *Rh. barbatum*, *Skimmia melanocarpa*, *Rosa sericea* 3000–3400 m alt.
Abies (dominant), *Thamnocalamus aristatus* (dominant), *Schefflera impressa* (abundant), *Acer sterculiaceum* 3400–3500 m alt.
k) Bhuspate Danra 3000 m alt.

Canopy: *Quercus pachyphylla* (dominant), *Tsuga dumosa* (abundant), *Rh. arboreum* (abundant), *Taxus Wallichiana* (abundant).

Undergrowth: *Berberis insignis*, *B. Wallichiana*, *B. acanthifolia*, *Ligustrum confusum*, *Viburnum erubescens*, *V. cordifolium*, *Rosa sericea*, *Magnolia Campbelliae*, *Lyonia ovalifolia*, *Anaphalis margaritacea*, *Pogostemon brachystachyus*, *Daphniphyllum himalayense*, *Gaultheria nummularioides*, *Sarcococca Hookeriana*, *Symplocos glomerata*, *S. laurina*.

In spite of sufficient elevation, coniferous forest was not observed in the following places.

Chia Bhanjang (3100 m)–Dentam (1450 m), Bilbatay Bhanjang (2200 m)–Tinjuray (2900 m), Diorali Bhanjang (3500 m)–Bandukay (2400 m), Khebang (1700 m)–Siling Tzokupa (3800 m).

Rhododendron forest is abundant at the top of Mt. Singalila and, together with small patches of *Abies spectabilis* and deciduous trees, extends to Chia Bhanjang. Without interruption of the coniferous forest, it changes to *Quercus* forest below 2800 m alt.

On the ridge of Siling Tzokupa, the Rhododendron forest consists of *Rh. barbatum*, *Rh. Falconeri*, *Rh. Hodgsoni*, and *Rh. lepidotum* is continuously seen from 2600 m to 3600 m alt. A deciduous forest consists of *Acer caudatum*, *Betula utilis*, *Viburnum erubescens*, and *Rh. Hodgsoni* with *Cirsium verutum*, *Rosa sericea*, *Aconitum spicatum* as undergrowth is seen in higher elevation.

In Japan, the Rhododendron forest is poorly developed. In central Honshu, it is found in the upper part of the coniferous forest or occurs along the timber line as a shrubby narrow belt composed of *Rh. Fauriae* and *Rh. Degronianum*. Another Rhododendron belt, although it is not a vegetational zone, is observed in the mixed coniferous-broadleaved forest zone. *Rh. Metternichii* var. *hondoense*, and *Rh. Makinoi* grow there.

The coniferous forest is the uppermost forest zone in Japan. Its principal species are *Abies Mariesi*, *A. Veitchii*, *Picea jezoensis*, and *Tsuga diversifolia*. Without any other dominant component, they often form dense forest above the deciduous broadleaved forest. *Abies firma* and *Tsuga Sieboldii* grow in the deciduous forest zone and are supposed to be the remnant of a mixed coniferous-broadleaved forest which has been cleared off by human agency.

5) Alpine Scrub and Meadows.

The forest of *Rhododendron* marks the timber line at a height of about 4000 m, and the area up to 5000 m alt. is occupied by alpine meadow with prostrate *Juniperus squamata* and low bushes of *Rhododendron anthopogon*, *Rh. elaeagnoides*, and *Rh. setosum*. A list of plants collected at Jongri is given below. (Pl. 14 a)

List of plants collected at Jongri (May 19–26, 1960).

Abies spectabilis
Tsuga dumosa
Juniperus squamata
J. Wallichiana
Salix sikkimensis
Bistorta vaccinifolia
Persicaria polystachya
Rheum acuminatum
Rheum nobile
Anemone demissa
A. obtusiloba
Caltha palustris var. *himalensis*
Clematis montana
Paroxygraphis sikkimensis
Ranunculus adoxifolius
R. Brotherusi

Meconopsis paniculata
M. simplicifolia
Sedum himalense
S. Wallichianum
Draba gracillima
Lignariella Hobsoni
Bergenia purpurascens
Ribes glaciale var. *laciniatum*
Saxifraga brachypoda
S. cordigera
S. Moorkroftiana
Fragaria Daltoniana
Potentilla fruticosa var. *arbuscula*
P. Kleiniana
P. microphylla
P. monanthes var. *sibthorpioides*
P. peduncularis
Rubus fragarioides
Sibbaldia cuneata
S. micropetala
Spiraea arcuata
Tithymalus Stracheyi
Myricaria germanica var. *prostrata*
Bupleurum longicaule var. *strictum*
Cassiope fastigiata
Rhododendron anthopogon
R. campanulatum
R. elaeagnoides
R. setosum
R. Wightii
Androsace Lehmanni
Primula Calderiana
P. capitata & subsp. *crispata*
P. deuteronana
P. glabra
Primula obliqua
P. primulina
Gentiana Elwesii
G. prolata
G. sikkimensis
Mandragora caulescens
Lagotis kunawurensis var. *sikkimensis*
Oreosolen Wattii
Pedicularis mollis
Picrorhiza scrophulariaeflora
Lonicera obovata
Cyananthus lobatus
Anaphalis contorta
A. nepalensis
Arisaema Wallichianum var. *sikkimense*
Agrostis inaequiglumis
Deyeuxine pulchella
D. scabrescens
Festuca polycolea
Koeleria argentea
Poa Aitchisonii
P. lahulensis
Bulbostylis densa
Carex Nakaoana
Kobresia Royleana
K. sikkimensis
Juncus leucanthus
J. membranaceus
J. sphacelatus
J. triglumis
Aletris pauciflora
Fritillaria cirrhosa
Lloydia Delavayi
Polygonatum Hookeri

6) Temperate Deciduous Forest.

Temperate deciduous forest does not occur in this region as a continuous vegetational zone, it is usually found only in small patches on the northern or eastern slope in the evergreen oak and the *Rhododendron* forest zones. *Acer Campbellii*, *A. pectinatum*, *A. sterculiaceum*, *A. caudatum*, *Betula utilis*, *Sorbus ursina*, *Magnolia Campbellii*, *Prunus cornuta*, *Brassaiopsis alpina*, *Viburnum cordifolium*, and *Schefflera impressa* are its members. (Pl. 3 a)

Temperate deciduous forest is one of the most prominent vegetational features of Japan and covers the greatest area of Japanese forest land. It has flourished in central Japan in the upper temperate zone between 400 and 1800 m alt. In the lower part the main components are *Quercus serrata*, *Q. acutissima*, and *Castanea crenata*, although they are supposed to be the substitute for the mixed coniferous-broadleaved forest, composed of above species and *Abies firma* and *Tsuga Sieboldii*, which has been already destroyed by human agency. In the upper part, *Quercus mongolica* var. *grosseserrata*, *Fagus crenata*, and *Abies homolepis* are the main species.

Temperate deciduous forest zone is prominent in Japan, North and Central China but becomes rare in the easternmost part of the Himalayan Range.

7) Daphniphyllum Forest.

A forest of *Daphniphyllum himalayense* including some *Rhododendron grande*, *Rh. barbatum*, and *Rh. arboreum* var. *Campbelliae* has been observed at the top of Bhandukay Bhanjang, 3100 m alt. A dense, 10 m high evergreen crown shelters the ground and allows little undergrowth.

8) Grassland

Grassland is not a common vegetational component in this region. At Siling Tzokupa, 3800 m alt., a purely grassy community is observed on the south-faced steep rocky slope. (Pl. 14 b) Its components are *Arundinella birmanica*, *Calamagrostis emodensis*, *Cymbopogon Stracheyi*, *Danthonia Schneideri*, and *Helictotrichon virescens*.

A grassy community is observed also at Jongri, 4000 m alt. (For the component, see page 22)

Between Chia Bhanjang and Tonglu, 3000–3500 m alt., where grazing is performed on the ridge, only the following grass species were collected: *Bromus himalaicus*, *Deyeuxine pulchella*, *Poa annua*, *Poa khasiana*.

9) Human Agency

Almost all of the natural vegetation has been destroyed in the middle elevation. Rice paddy is the most common cultivation at lower altitudes. It occurs up to 1900 m alt. where water supply is possible.

Other cereals observed are *Zea Mays*, *Triticum aestivum*, *Hordeum vulgare*, *Fagopyrum esculentum*, *F. tataricum*, and *Eleusine Coracana* (Pl. 16 b & c). *Zea Mays* is found in lower to middle altitudes, *Triticum*, *Hordeum*, and *Fagopyrum* in middle to upper altitudes. *Eleusine* for food and also for native wine is common in the middle elevation. The upper limit of the cultivated area is 2000–2400 m alt. Because of the steep mountain slope of this region, innumerable terraced fields dot the landscape. (Pl. 16 a)

The following plants are common vegetables of the area: *Solanum tuberosum*, *S. Lycopersicum*, *S. Melongena*, *Allium Cepa*, *Ipomoea Batatas*, *Raphanus acanthiformis*, *Brassica oleracea* and var. *botrytis*, *B. juncea*, *B. Rapa*, *Glycine Max*, *Phaseolus vulgaris*, *P. coccineus*, *P. Mungo*, *P. lunatus*, *P. pubescens*, *Pisum sativum*, *Sechium edule*, *Benincasa cerifera*, *Cucumis sativus*, *C. Melo*, *Momordica Charantia*, *Cucurbita moschata*, *Lagenaria siceraria*, *Dolichos Lablab*, *Arachis hypogaea*.

Vegetable fields are usually small, and may supply food sufficient only for the owner's use.

Sechium edule is the most common hedge plant at middle and lower altitudes, as its fruit, root, and juvenile stem are used as food.

Capsicum annuum and *C. frutescens* are found in gardens and *Amomum* sp. in shady humid places. These spices are widely cultivated at middle and lower altitudes. *Guizotia abyssinica*, *Brassica juncea*, and *B. Rapa* are cultivated as oil plants. *B. Rapa* is especially widespread in the southern part.

Large tea gardens have been established in Darjeeling, Siliguri, and Illam. But the tea tree is not commonly cultivated and is rarely found in other places.

Sikkim orange (*Citrus reticulatus*) is widely cultivated around Darjeeling, Illam, and Chyangthaphu. Other cultivated plants observed were *Musa paradisiaca, Carica Papaya, Nicotiana, Tabacum, Saccharum officinarum,* and *Morinda oleifera.*

Alnus nepalensis is a characteristic feature of the rural landscape at middle altitude. It grows beside streams or in humid places, and is planted for its wood around villages and at the corners of farmers' gardens. (Pl. 15 a)

Grazing animals are generally prevailing in the region. Cows and goats graze on abandoned crop fields in lower and middle altitudes. Grazing yaks are performed in summer in the alpine meadows above 4000 m. The vegetation of the grazing grounds is somewhat different from its surroundings. Grazed-over shrubby vegetation is seen on the ridges of Singalila, Siling Tzokupa, and some other places. It consists of *Viburnum erubescens, Berberis insignis, Rosa sericea, Cotoneaster congestus, C. nitidus, Rhododendron* spp., *Diplopterygium volubile, Osbeckia nepalensis, Phyllanthus parvifolius* and so on.

Through uncontrolled deforestation and cultivation, large tracts of land have now been left abandoned. Landslides caused by large amount of rainfall in monsoon season were seen in some places. According to the author's observation at Bharomdin, the first plants to begin growing in the denuded land are *Alnus nepalensis, Eupatorium odoratum,* and *Lantana Camara,* the second are *Schima Wallichii, Castanopsis indica,* and *Pogostemon fruticosa.*

Thamnocalamus aristatus is seen at 2800–3600 m alt. It is abundant where the vegetation has been burned or disturbed by grazing. *Arundinaria Maling* grows from 1600 to 3100 m alt. and forms dense thickets in some places. (Pl. 12 c) From Bakkim to Jongri, 2650–2900 m alt., the thickets are hardly penetrable, and *Polystichum* sp. is the only undergrowth found in it.

AN OUTLINE OF JAPONO-HIMALAYAN RELATED PLANTS

Our collection includes many Japono-Himalayan related plants.

In the following table, the author lists all species common to Himalaya and Japan, and some plants which are closely related but belong to different species in the two regions.

Explanations of abberviations in the table

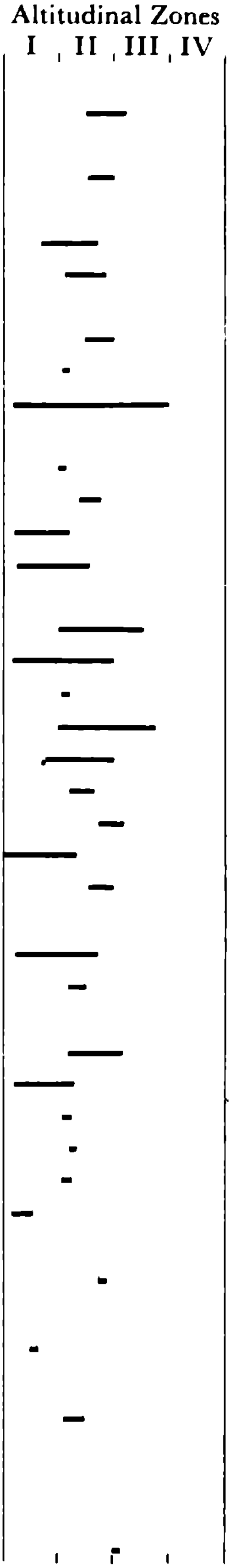
Altitudinal zones

I	0—1000 m
II	1000—2000 m
III	2000—3000 m
IV	3000 m and above

Groups

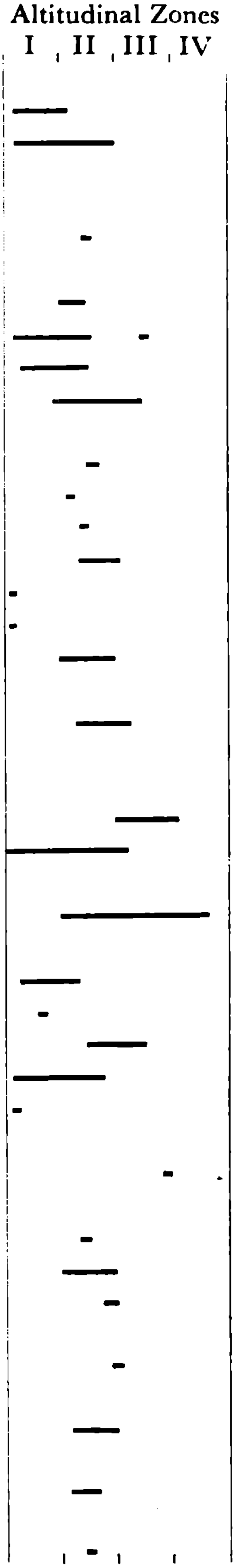
W	Weedy plant growing in open place, roadside, and cultivated field.
R	Plant growing in rice paddy, swamp, pond, etc.
C	Cultivated or recently naturalized plant.
A	Alpine plant.
M	Plant not belong to any of the above categories. Mostly of temperate indigenous.

I and II under Group M Subgroups of Group M. For explanation see page 36.

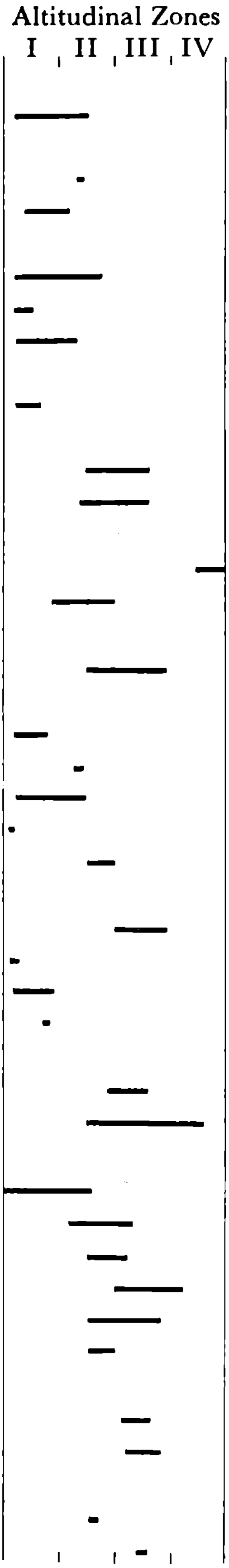


Himalayan Plants	Corresponding Japanese Plants	W	R	C	A	M
Saururaceae						
Houttuynia cordata	*H. cordata*					I
Myricaceae						
Myrica esculenta	*M. rubra*					I
Fagaceae						
Quercus acutissima	*Q. acutissima*					II
Q. glauca	*Q. glauca*					I
Moraceae						
Ficus sarmentosa	*F. s.* ssp. *nipponica*					I
Maclura cochinchinensis	*M. c.* var. *gerontogea*					I
Morus australis	*M. australis*			○		
Urticaceae						
Debregeasia longifolia	*D. edulis*					I
Gonostegia hirta	*G. hirta*					I
Pouzolzia zeylanica	*P. zeylanica*					I
Villebrunea frutescens	*V. frutescens*					I
Polygonaceae						
Persicaria chinensis	*P. c.* var. *Thunbergiana*					I
P. Kawagoeana	*P. Kawagoeana*		○			
P. longiseta	*P. longiseta*	○				
P. nepalensis	*P. nepalensis*					II
P. perfoliata	*P. perfoliata*					II
P. pubescens	*P. pubescens*		○			
P. Thunbergii	*P. Thunbergii*					II
Polygonum plebejum	*P. plebejum*	○				
Rumex nepalensis	*R. nepalensis*					I
Chenopodiaceae						
Chenopodium album	*C. album*	○				
C. ambrosioides	*C. ambrosioides*	○				
Amaranthaceae						
Achyranthes bidentata	*A. b.* var. *japonica*					II
Alternanthera sessilis	*A. sessilis*	○				
Amaranthus caudatus	*A. caudatus*			○		
A. lividus	*A. lividus*	○				
A. spinosus	*A. spinosus*	○				
Celosia argentea	*C. argentea*	○				
Phytolaccaceae						
Phytolacca acinosa	*P. a.* var. *esculenta*					I
Aizoaceae						
Mollugo pentaphylla	*M. pentaphylla*	○				
Portulacaceae						
Portulaca oleracea	*P. oleracea*	○				
Caryophyllaceae						
Cerastium holosteoides ssp. *triviale* var. *hallaisanensis*	*C. h.* ssp. *t.* var. *hallaisanensis*	○				

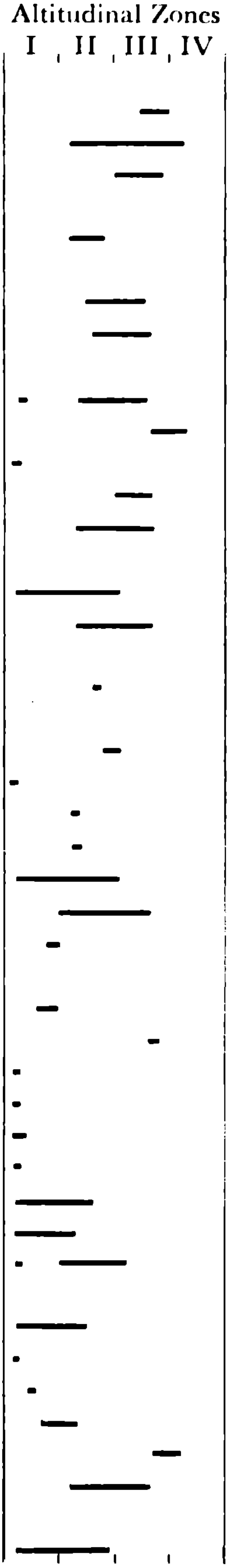
Himalayan Plants	Altitudinal Zones				Corresponding Japanese Plants	Groups				
	I	II	III	IV		W	R	C	A	M
Drymaria diandra		▬			*D. cordata* var. *pacifica*	○				
Pseudostellaria cashmiriana			▬		*P. heterantha*					I
Sagina japonica		▬	▬		*S. japonica*	○				
Stellaria Alsine var. *undulata*		▬			*S. A.* var. *undulata*	○				
S. aquatica		▬			*S. aquatica*					II
S. media		▬			*S. media*					II
S. monosperma var. *monosperma*			▬		*S. m.* var. *japonica*					I
Ranunculaceae										
Anemone vitifolia		▬	▬		*A. hupehensis* var. *japonica*					I
Caltha palustris var. *himalensis*				▬	*C. p.* var. *membranacea*				○	
Magnoliaceae										
Magnolia globosa			▬		*M. Sieboldii*					II
Capparidaceae										
Crateva religiosa		▬			*C. religiosa*					I
Curciferae										
Capsella Bursa-pastoris		▬			*C. Bursa-pastoris*	○				
Cardamine impatiens			▬		*C. impatiens*					II
C. scutata ssp. *flexuosa*		▬	▬		*C. s.* ssp. *flexuosa*		○			
Nasturtium officinale		▬	▬		*N. officinale*		○			
Rorippa dubia		▬	▬		*R. dubia*	○				
Droseraceae										
Drosera peltata var. *lunata*			▬		*D. p.* var. *lunata*					I
Podostemaceae										
Hydrobryum Griffithii		▬			*H. japonica*					I
Crassuraceae										
Sedum pseudosubtile			▬		*S. subtile*					I
Saxifragaceae										
Astilbe rivularis		▬	▬		*A. Thunbergii*					I
Hydrangea anomala		▬	▬		*H. petiolaris*					I
Tiarella polyphylla			▬		*T. polyphylla*				○	
Rosaceae										
Agrimonia pilosa var. *nepalensis*		▬	▬		*A. p.* var. *japonica*					II
Aruncus dioicus var. *triternatus*			▬	▬	*A. d.* var. *kamtschaticus*					II
Duchesnea indica	▬	▬	▬		*D. indica*					II
Fragaria nubicola			▬	▬	*F. nipponica*					II
Potentilla fruticosa var. *arbuscula*			▬	▬	*P. f.* var. *arbuscula*				○	
Rubus asper		▬	▬		*R. croceacanthus*					I
R. sumatranus		▬			*R. sumatranus*					I
Spiraea micrantha		▬	▬		*S. japonica*					II



Himalayan Plants	Corresponding Japanese Plants	W	R	C	A	M
Leguminosae						
Aeschynomene indica	*A. indica*		○			
Albizia Julibrissin	*A. Julibrissin*					II
Amphicarpaea bracteata ssp. *Edgeworthii* var. *Edgeworthii*	*A. b.* ssp. *E.* var. *japonica*					II
Cassia mimosoides ssp. *mimosoides*	*C. m.* ssp. *Nomame*	○				
Crotalaria sessiliflora	*C. sessiliflora*					II
Desmodium heterocarpon	*D. heterocarpon*					I
D. microphyllum	*D. microphyllum*					I
D. oxyphyllum & var. *mandshuricum*	*D. o.* & var. *mandshuricum*					II
D. podocarpum	*D. podocarpum*					II
Entada phaseoloides	*E. phaseoloides*					I
Smithia ciliata	*S. ciliata*	○				
Vicia angustifolia	*V. angustifolia*	○				
V. hirsuta	*V. hirsuta*	○				
Zornia gibbosa	*Z. g.* var. *cantoniensis*	○				
Geraniaceae						
Geranium nepalense	*G. n.* var.. *Thunbergii*					II
Oxalidaceae						
Oxalis Acetosella & ssp. *Griffithii*	*O. A.* & ssp. *G.*					II
O. corniculata	*O. corniculata*	○				
Rutaceae						
Boenninghausenia albiflora	*B. a.* var. *japonica*					I
Euphorbiaceae						
Chamaesyce hirta	*C. hirta*	○				
C. supina	*C. supina*	○				
Mercurialis leiocarpa	*M. leiocarpa*					I
Phyllanthus Urinaria	*P. Urinaria*	○				
Securinega suffruticosa	*S. s.* var. *japonica*					II
Coriariaceae						
Coriaria nepalensis	*C. japonica*					I
Anacardiaceae						
Choerospondias axillaris	*C. axillaris*			○		
Rhus javanica	*R. javanica*					II
R. succedanea	*R. succedanea*					I
Aquifoliaceae						
Ilex crenata var. *Thomsoni*	*I. c.* var. *crenata*					I
Celastraceae						
Euonymus Hamiltonianus	*E. H.* var. *Sieboldianus*					II
Sapindaceae						
Sapindus Mukorossi	*S. Mukorossi*			○		
Rhamnaceae						
Hovenia acerba	*H. dulcis*					I

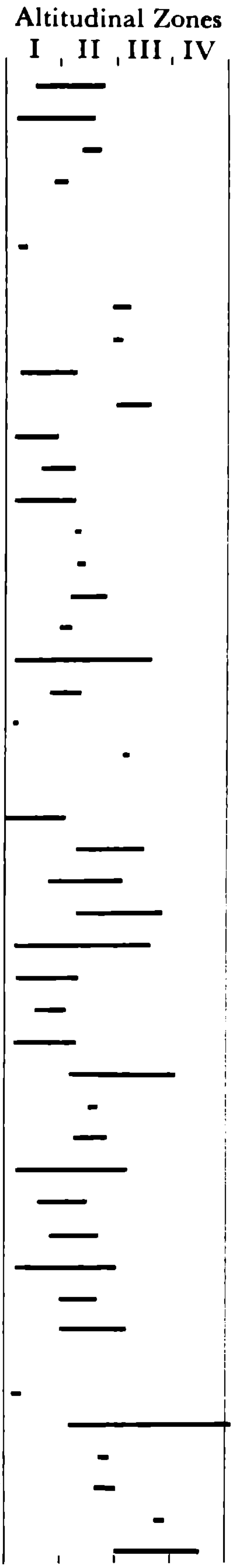


Himalayan Plants	Corresponding Japanese Plants	W	R	C	A	M
Vitaceae						
Cayratia japonica	*C. japonica*	○				
Tiliaceae						
Triumfetta annua	*T. japonica*	○				
T. Bartramia	*T. Bartramia*	○				
Malvaceae						
Sida acuta	*S. actua*	○				
S. rhombifolia	*S. rhombifolia*	○				
Urena lobata	*U. lobata*	○				
Sterculiaceae						
Melochia corchorifolia	*M. corchorifolia*	○				
Theaceae						
Camellia Kissi	*C. Sasanqua*					I
Eurya acuminata	*E. japonica*					I
Violaceae						
Viola biflora	*V. biflora*				○	
V. diffusa	*V. d.* var. *glabella*					I
Stachyuraceae						
Stachyurus himalaica	*S. praecox*					I
Lythraceae						
Ammannia baccifera	*A. baccifera*		○			
A. multiflora	*A. multiflora*		○			
Rotala indica	*R. indica*		○			
R. leptopetala	*R. leptopetala*		○			
R. rotundifolia	*R. rotundifolia*		○			
Onagraceae						
Circaea alpina ssp. *imaicola*	*C. alpina*				○	
Ludwigia adscendens	*L. a.* ssp. *stipulacea*		○			
L. octovalvis	*L. octovalvis*		○			
L. prostrata	*L. epilobioides*		○			
Araliaceae						
Hedera nepalensis	*H. rhombea*					I
Panax pseudo-Ginseng	*P. japonicus*					II
Umbelliferac						
Centella asiatica	*C. asiatica*	○				
Hydrocotyle nepalensis	*H. nepalensis*					I
H. sibthorpioides	*H. sibthorpioides*					I
Pimpinella diversifolia	*P. diversifolia*					I
Sanicula elata	*S. chinensis*					II
Torilis japonica	*T. japonica*					II
Cornaceae						
Aucuba himalaica	*A. japonica*					I
Helwingia himalaica	*H. japonica*					I
Pyrolaceae						
Monotropa uniflora	*M. uniflora*					II
Monotropastrum humile	*M. h.* var. *tripetalum*					II



Himalayan Plants	Corresponding Japanese Plants	W	R	C	A	M
Ericaceae						
Enkianthus deflexa	*E. campanulatus*					I
Lyonia ovalifolia	*L. o.* ssp. *Neziki*					I
Pieris formosa	*P. japonica*					I
Myrsinaceae						
Ardisia macrocarpa	*A. crenata*					I
Primulaceae						
Lysimachia debilis	*L. japonica*					I
L. ramosa	*L. shikokiana*					I
Gentianaceae						
Gentiana pedicellata	*G. squarrosa*					II
Halenia elliptica	*H. corniculata*				○	
Nymphoides cristata	*N. indica*		○			
Swertia bimaculata	*S. bimaculata*					I
Tripterospermum volubile	*T. japonicum*					I
Boraginaceae						
Cynoglossum lanceolatum	*C. l.* var. *formosanum*					I
C. zeylanicum	*C. zeylanicum*					I
Verbenaceae						
Verbena officinalis	*V. officinalis*			○		
Labiatae						
Elsholtzia ciliata	*E. ciliata*	○				
Leonurus sibiricus	*L. sibiricus*					II
Mentha arvensis	*M. a.* var. *piperascens*			○		
Mosla dianthera	*M. dianthera*		○			
Perilla frutescens	*P. frutescens*			○		
Prunella vulgaris	*P. vulgaris*					II
Teucrium viscidum	*T. v.* var. *Miquelianum*		○			
Scrophulariaceae						
Dopatrium junceum	*D. junceum*		○			
Ellisiophyllum pinnatum	*E. p.* var. *reptans*					I
Limnophila aromatica	*L. aromatica*		○			
L. indica	*L. indica*		○			
L. sessiliflora	*L. sessiliflora*		○			
Lindernia Pyxidaria	*L. Pyxidaria*		○			
Mazus japonicus	*M. japonicus*	○				
Microcarpaea minima	*M. minima*		○			
Mimulus nepalensis	*M. n.* var. *japonica*					I
Vandellia Anagallis var. *verbenaefolia*	*V. A.* var. *verbenaefolia*		○			
V. angustifolia	*V. angustifolia*		○			
V. cordifolia	*V. cordifolia*		○			
V. crustacea	*V. crustacea*		○			
Veronica cana	*V. c.* var. *Miqueliana*					I
V. javanica	*V. javanica*	○				
Orobanchaceae						
Aeginetia indica	*A. i.* var. *gracilis*					I

Himalayan Plants	Altitudinal Zones I , II , III , IV	Corresponding Japanese Plants	W	R	C	A	M
Acanthaceae							
Justicia procumbens var. *simplex*	—	*J. p.* var. *leucantha*	○				
Phrymaceae							
Phryma Leptostachya var. *oblongifolia*	—	*P. L.* var. *oblongifolia*					II
Plantaginaceae							
Plantago major var. *angusta*	—	*P. m.* var. *japonica*	○				
Rubiaceae							
Hedyotis diffusa	▪	*H. diffusa*	○				
Paederia scandens	▪	*P. s.* var. *Mairei*					I
Rubia Wallichiana	—	*R. Akane*					II
Valerianaceae							
Valeriana Hardwickii	—	*V. flaccidissima*					I
Cucurbitaceae							
Gynostemma pentaphylla	—	*G. pentaphylla*					I
Melothria purpsilla	—	*M. purpsilla*					I
Campanulaceae							
Lobelia alsinoides	—	*L. Hancei*		○			
L. chinensis	▪	*L. chinensis*		○			
Peracarpa carnosa	—	*P. c.* var. *circaeoides*					I
Compositae							
Anaphalis Busua	—	*A. sinica*					II
A. margaritacea	—	*A. margaritacea*					II
Artemisia dubia	—	*A. dubia*					II
A. indica	—	*A. indica*	○				
A. japonica	—	*A. japonica*					II
Bidens bipinnata	—	*B. bipinnata*	○				
B. pilosa	—	*B. pilosa*	○				
B. tripartita	▪	*B. tripartita*	○				
Carpesium abrotanoides	—	*C. abrotanoides*					II
Centipeda minima	—	*C. minima*	○				
Conyza japonica	—	*C. japonica*					I
Dichrocephala bicolor	—	*D. bicolor*	○				
Eclipta prostrata	—	*E. prostrata*	○				
Emilia sonchifolia	—	*E. sonchifolia*	○				
Erigeron canadensis	▪	*E. canadensis*	○				
E. sumatrensis	—	*E. sumatrensis*	○				
Gnaphalium affine	—	*G. affine*	○				
G. hypoleucum	▪	*G. hypoleucum*	○				
G. indicum	—	*G. indicum*	○				
Picris hieracioides ssp. *kaimaensis*	▪	*P. h.* ssp. *japonica*					II
Rhynchospermum verticillatum	▪	*R. verticillatum*					I
Senecio scandens	—	*S. scandens*					I
Siegesbeckia orientalis	—	*S. orientalis*	○				



Himalayan Plants	Corresponding Japanese Plants	W	R	C	A	M
Synedrella nodiflora	*S. nodiflora*	○				
Vernonia cinerea	*V. cinerea*	○				
Wedelia biflora	*W. biflora*	○				
Youngia japonica	*Y. japonica*	○				
Hydrocharitaceae						
Blyxa Aubertii	*B. Aubertii*		○			
Gramineae						
Agrostis gigantea	*A. gigantea*	○				
Anthoxanthum odoratum	*A. odoratum*			○		
Brachiaria villosa	*B. villosa*	○				
Brachypodium sylvaticum	*B. sylvaticum*					II
Cynodon Dactylon	*C. Dactylon*	○				
Digitaria adscendens	*D. adscendens*	○				
D. timorensis	*D. timorensis*	○				
D. violascens	*D. violascens*	○				
Dimeria ornithopoda	*D. o.* var. *tenera*		○			
Echinochloa Crusgalli	*E. Crusgalli*		○			
Eleusine Coracana	*E. Coracana*			○		
E. indica	*E. indica*	○				
Eragrostis japonica	*E. japonica*	○				
E. pilosa	*E. pilosa*	○				
Holcus lanatus	*H. lanatus*			○		
Imperata cylindrica var. *major*	*I. c.* var. *Koenigii*					II
Microstegium nudum	*M. nudum*					I
M. vimineum	*M. vimineum*					I
Miscanthus nepalensis	*M. sinensis*					II
Oplismenus compositus	*O. compositus*	○				
Paspalum distichum	*P. distichum*	○				
P. longifolium	*P. longifolium*			○		
P. orbiculare	*P. orbiculare*	○				
Poa annua	*P. annua*	○				
Pogonatherum crinitum	*P. crinitum*	○				
Polypogon fugax	*P. fugax*		○			
Sacciolepis indica	*S. indica*		○			
Schizachyrium brevifolium	*S. brevifolium*		○			
Setaria pallide-fusca	*S. pallide-fusca*	○				
S. palmifolia	*S. palmifolia*	○				
S. plicata	*S. plicata*	○				
Sporobolus fertilis	*S. fertilis*	○				
Cyperaceae						
Bulbostylis barbata	*B. barbata*	○				
B. densa	*B. densa*	○				
Carex capillacea	*C. capillacea*		○			
C. japonica var. *chlorostachys*	*C. j.* var. *chlorostachys*					I
C. microglochin	*C. microglochin*				○	
C. nubigena	*C. n.* var. *Francheliana*		○			

Himalayan Plants	Altitudinal Zones				Corresponding Japanese Plants	Groups				
	I	II	III	IV		W	R	C	A	M
Carex rara				—	*C. r.* ssp. *biwensis*		○			
C. Rochebruni			—		*C. Rochebruni*					I
Cyperus brevifolius	—	—			*C. brevifolius*		○			
C. compressus	—	—			*C. compressus*	○				
C. cyperoides	—	—			*C. cyperoides*	○				
C. Haspan	—	—			*C. Haspan*		○			
C. Iria	—	—			*C. Iria*	○				
C. Michelianus	—				*C. M.* ssp. *pacificus*		○			
C. pilosus	—				*C. pilosus*		○			
C. rotundus	—				*C. rotundus*	○				
C. sanguinolentus	—	—			*C. sanguinolentus*		○			
C. tenuispica	—				*C. tenuispica*		○			
Eleocharis congesta	—	—			*E. c.* ssp. *japonica*		○			
E. dulcis	—				*E. dulcis*		○			
Fimbristylis aestivalis	—	—			*F. aestivalis*	○				
F. complanata	—				*F. complanata*		○			
F. dichotoma	—	—			*F. dichotoma*	○				
F. littoralis	—	—			*F. littoralis*		○			
F. squarrosa		—			*F. squarrosa*		○			
Scirpus juncoides	—	—			*S. juncoides*		○			
S. mucronatus		—			*S. mucronatus*		○			
S. supinus ssp. *lateriflorus*	—				*S. s.* var. *leiocarpus*		○			
Scleria levis	—				*S. levis*					I
Araceae										
Acorus Calamus		—			*A. Calamus*					II
Lemnaceae										
Lemna paucicostata		—			*L. paucicostata*		○			
Wolffia arrhiza		—			*W. arrhiza*		○			
Commelinaceae										
Commelina benghalensis	—	—			*C. benghalensis*	○				
C. diffusa	—	—			*C. diffusa*	○				
Murdannia nudiflora	—				*M. nudiflora*		○			
Streptolirion volubile		—	—		*S. volubile*					II
Pontederiaceae										
Monochoria vaginalis	—	—			*M. vaginalis*		○			
Juncaceae										
Juncus effusus		—			*J. e.* var. *decipiens*		○			
J. Leschenaultii	—	—			*J. Leschenaultii*		○			
J. monticola		—			*J. monticola*		○			
J. triglumis				—	*J. triglumis*				○	
J. Wallichianus		—			*J. Wallichianus*		○			
Luzula rostrata ssp. *darjeelingensis*			—		*L. rostrata*				○	
L. sudetica				—	*L. s.* var. *nipponica*				○	
Liliaceae										
Cardiocrinum giganteum		—	—		*C. cordatum*					I
Clintonia udensis var. *alpina*				—	*C. udensis*				○	

Himalayan Plants	Altitudinal Zones I	II	III	IV	Corresponding Japanese Plants	Groups W	R	C	A	M
Lloydia serotina				▬	*L. serotina*				○	
Ophiopogon intermedius		▬	▬		*O. planiscapus*					I
Hypoxidaceae										
Hypoxis aurea		▬			*H. aurea*					I
Dioscoreaceae										
Dioscorea bulbifera	▬	▬			*D. bulbifera*					II
Iridaceae										
Iris Clarkei				▬	*I. sanguinea*					II
Belamcanda chinensis		▬			*B. chinensis*					II
Burmanniaceae										
Burmannia nepalensis		▬			*B. liukiuensis*					I
Orchidaceae										
Cremastra appendiculata		▬	▬		*C. appendiculata*					I
Goodyera procera		▬			*G. procera*					I
G. repens			▬		*G. repens*					II
Habenaria dentata		▬			*H. Miersiana*					I
Herminium angustifolium			▬		*H. angustifolium*					II
Spiranthes sinensis ssp. *australis*		▬			*S. s.* ssp. *australis*					II
Tipularia Josephii			▬		*T. japonica*					I

The list is statistically summarized in table 2.

The largest number of specimens were gathered in zone II while the next largest in zones I and III. Of the total 295 plants listed, 206 are recognized as identical between Himalaya and Japan, 44 are infraspecifically different, and 45 plants belong to different species; this number may increase on further study.

In order to observe the detailed feature of floristic relationship, the author grouped plants into five categories: W, R, C, A, and M. (For explanation see page 24)

Almost all W and R group plants are conspecific between Himalaya and Japan and grow in zones I and II. In M group, interspecific vicarious plants as well as intraspecific ones are present, and they are found primarily in zones II and III. A large proportion of plants found in zone II is the overlapping feature of the habitats of groups W, R, and M.

DISTRIBUTION OF JAPONO-HIMALAYAN RELATED PLANTS

Gross patterns of distribution are similar among the members of each group, but the patterns may differ in detail.

W group

Most of the members of this group are weedy plants growing in open, barren places, along roadsides, and in cultivated areas; they are distributed in tropical and subtropical regions and sometimes in temperate regions without showing vicarism.

For example, *Oxalis corniculata* occurs throughout Japan, the Bonin Islands,

Table 2.

Relation		Alt. Zone	W	R	C	A	M	Total
Intraspecific	Identical	I	52	31	3		13	99
		II	65	31	9		48	153
		III	16	5	3	3	34	61
		IV	2			4	2	8
		Total Species	79	47	10	6	64	206
	Different	I		5			6	11
		II	4	3	1		19	27
		III	1	2		3	14	20
		IV		2		3	3	8
		Total Species	4	9	1	5	25	44
Interspecific		I		3			2	5
		II	2				27	29
		III				1	33	34
		IV				1	5	6
		Total Species	2	3	0	1	39	45
		Grand Total Species	85	59	11	12	128 I…77 II…51	295
Total		I	52	39	3		21	115
		II	71	34	10		94	209
		III	17	7	3	7	81	115
		IV	2	2		8	10	22

Ryukyus, Korea, Formosa, Malaysia, Eurasia, N. Africa, and Australia.

R group

The distribution pattern of plants belonging to this group is similar to that of W group. Its members are weedy in nature and grow in rice paddies, swamps and ponds. They are also widely distributed in tropical, subtropical, and temperate regions. Most of them are conspecific between Himalaya and Japan. For example, *Ammannia multiflora* occurs in Japan (Honshu, Shikoku, and Kyushu), Ryukyu, Formosa, S. E. Asia, Central Asia, Malaysia, Australia, and Africa.

A group

Including various types of distribution, plants belonging to this group are scarce in number.

Viola biflora is a component of circumboreal-distributed plants. Its area is Europe, Siberia, Himalaya, Central Asia, West and Central China, North Korea, Japan (Hokkaido, Honshu (central and northern parts), Shikoku, and S. Kyushu), and North America. *Tiarella* and *Clintonia* are other examples. They are restricted to Himalaya, East Asia, and North America and may be considered together with some members of M group.

Juncus monticola and *Luzula rostrata* are examples of plants which occur in Himalaya and Japan disjunctly. The discontinuity may be explained by a detailed study of plants in the intervening areas.

M group

This group consists primarily of mesophytic plants found in the temperate zone, i.e. zones II and III, extending into temperate East and South Asia. (Fig. 8) The group is considered as to best demonstrate the close botanical relationship between Himalaya and Japan. Its northern range is apparently limited by the arid and cold Tibetan and Mongolian climate, while its southern range is not uniform, especially in southeast Asia; some are restricted to South China, North Indo-China, North Thailand, and North Burma while others spread to Malaysia, Indonesia, Philippines, and/or Australia.

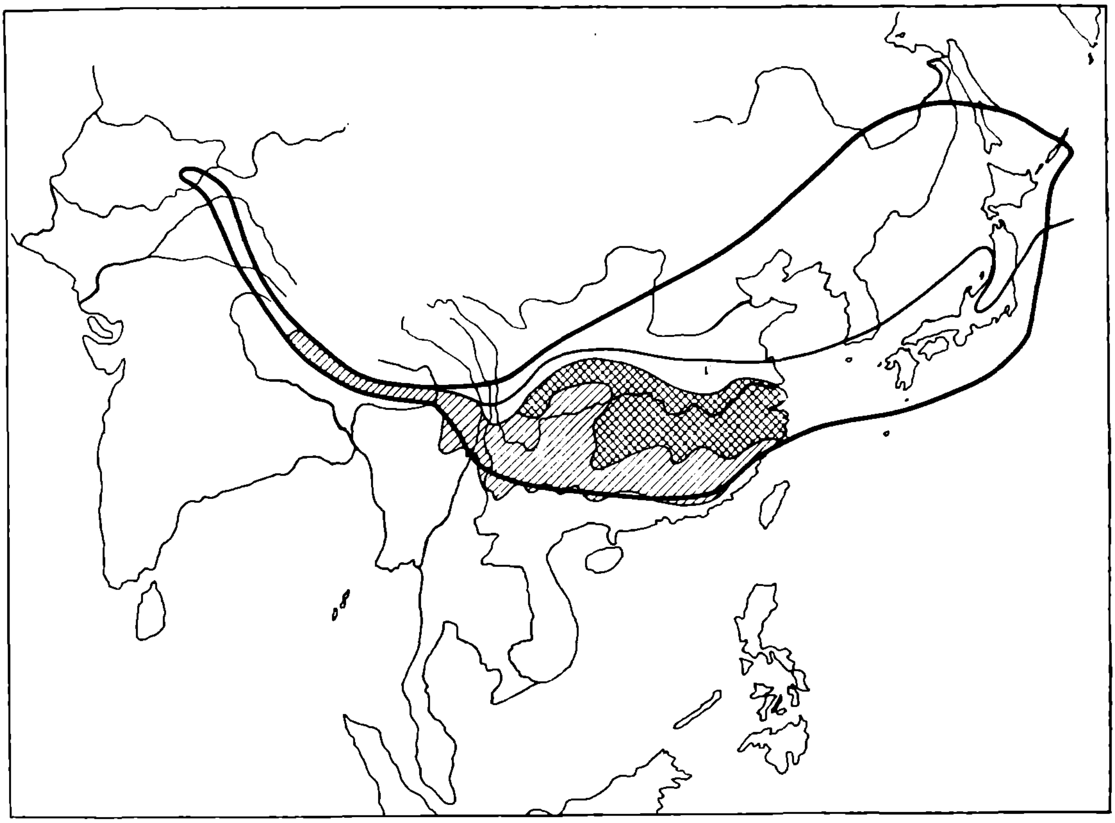


Fig 8. Area of Japono-Himalayan related plants.

Thick line: Sino-Japanese floristic region.
Thin line: 0°C isothermal of January mean temperature.
Hatched area; Evergreen oak forest. (After Wang, C. W. 1961 and Schweinfruth U. 1961)
Double hatched area: Mixed mesophytic forest. (After Wang, C. W. 1961)

Of the total 128 plants listed as M group, 64 plants are common to Himalaya and Japan, 25 are intraspecifically differentiated, and 39 plants are in interspecific vicarious relation.

With the exception of *Tiarella polyphylla* and *Clintonia udensis* var. *alpina*, which are included in A group, M group contains most of the genera, such as *Magnolia*, *Panax*, *Pieris*, *Lyonia*, and *Phryma*, commonly distributed in East Asia and North America, which are considered as the descendants of the temperate plant group widely distributed in these regions during the Tertiary period.

Observing their areas, especially those in the northeastern part of the continent, the following two types of distribution are clearly recognized.

I. Absent from northeastern China, Manchuria, Amur, and Korea proper except its southernmost part. (Marked as I in the list) (Fig. 10 & 11)

II. Present in Korea proper and also northeastern China, Manchuria, or Amur. (Marked as II in the list) (Fig. 9)

M–I group

This is the southern element of M group. The northern limit of the group on the Continent is corresponding to that of the mixed mesophytic forest in which evergreen oaks are mixed with deciduous broadleaved trees and is approximately parallel to the 0°C isothermal of January mean temperature. In Japan, the northern ranges of the group's members are not confined to particular forest types; some are to evergreen oak forest, i.e. northern Honshu, some are to deciduous broadleaved forest, southern Hokkaido, and others are to coniferous forest, southern Saghalin and the southern Kuriles.

There are some other members distributed in tropical and subtropical Asia; their area in China is restricted to the southern parts of the country. They are

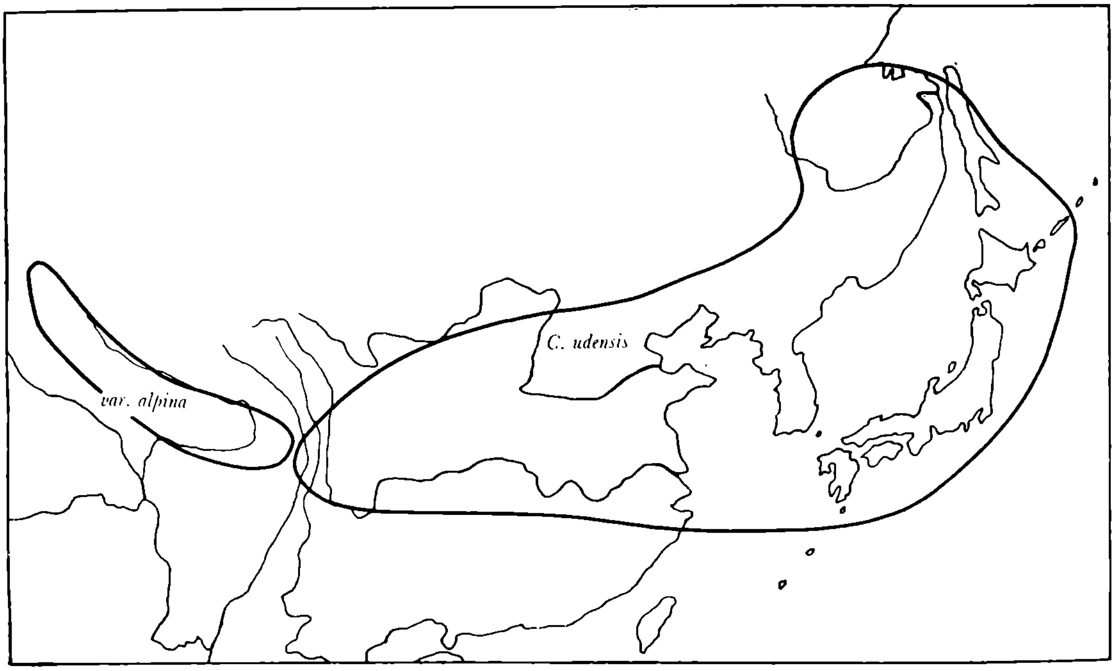


Fig. 9. Distribution of *Clintonia udensis*. (Kanai 1963)

Hydrocotyle nepalensis, *Entada phaseoloides*, *Drosera peltata*, *Crateva religiosa* (Fig. 11), *Maclura cochinchinensis*, *Aeginetia indica*, *Myrica esculenta*, etc.

M–II group

This is the northern element of M group. Aridity seems to determine the northern limit of this group on the Continent. Its southern range is almost parellel to that of the mixed mesophytic forest suggesting the influence of subtropical monsoon climate as its limitting condition. In Japan, most members of this group

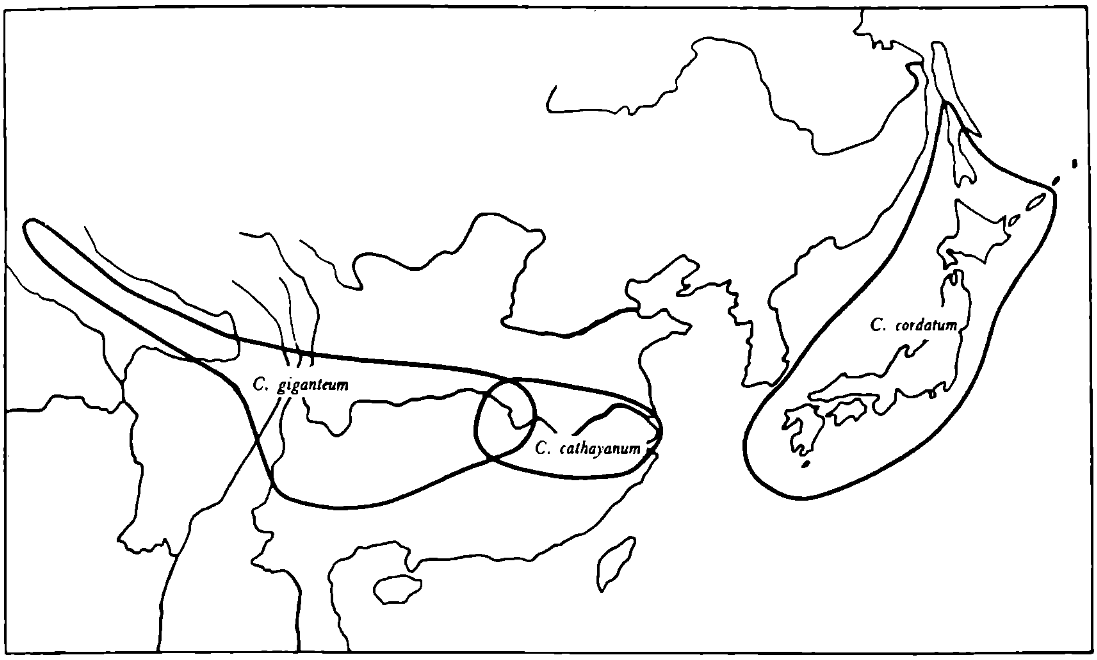


Fig. 10. Distribution of *Cardiocrinum* (Kanai 1963).

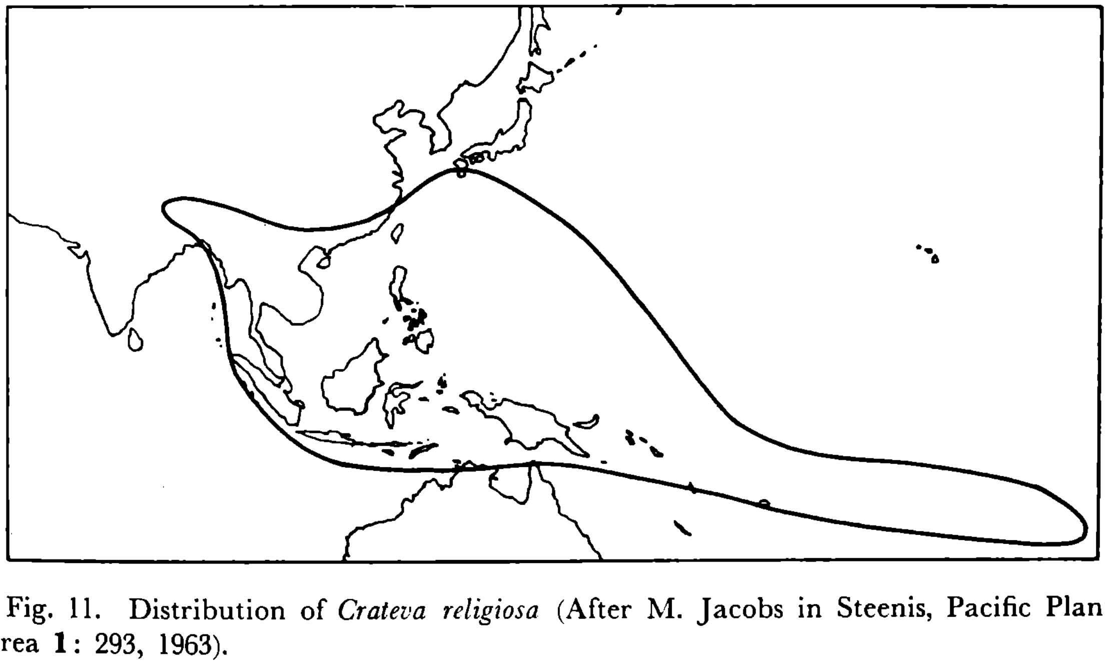


Fig. 11. Distribution of *Crateva religiosa* (After M. Jacobs in Steenis, Pacific Plant Area **1**: 293, 1963).

are distributed northward to southern Saghalin. (Fig. 10)

The distribution areas of these plants overlap in the southwestern part of China. In that area occur such ancient and phylogenetically important plants as *Tetracentron*, *Euptelea*, and *Cercidiphyllum.*

We discovered *Tetracentron sinense* var. *himalense* in eastern Nepal. The new localities are some distance from the nearest known locality in northern Burma. Recent fossil evidence shows the occurrence of a closely related plant, *Tetracentronites japonica*, in central Japan in the Cretaceous period—another indication of the close relationship between Himalayan and Japanese flora and the importance of southwestern China as a common place of development for Japono-Himalayan related plants.

SYSTEMATIC ENUMERATION OF THE PLANTS COLLECTED

This list contains the botanical collections from Eastern Himalaya (mostly Sikkim and East Nepal) by the Botanical Expeditions of University of Tokyo in 1960 and 1963. The greater part of Spermatophyta was studied by the members of the Expeditions and the staffs of University of Tokyo, but some families as well as cryptogamic plants were treated by specialists of the group. The names of the investigators are given at the beginning of each families in parentheses. The genera and species in a family are arranged in alphabetical order.

The specimens cited here are mostly deposited in the Herbarium of Faculty of Science, University of Tokyo (TI). Their duplicates are distributed to Kyoto University, and also to other herbaria at home and abroad. The numeral in metre given after the locality shows an approximate altitude above the sea level. The collector's names are omitted in order to save a space, but can be traced from the table of our itinerary on pages 2–10. The regions showing the distribution are usually arranged from west to east. For example, ' Kumaon to Bhutan ' means that the species is distributed from Kumaon through Nepal and Sikkim east to Bhutan. The word, Sikkim, is generally used in an old sense including the Darjeeling and Kalimpong districts of West Bengal.

SPERMATOPHYTA

GYMNOSPERMAE

CYCADACEAE (by Takasi Tuyama)

Cycas pectinata Griffith, Notul. **4**: 10 (1854); Icon. Pl. Asia. t. 360, f. 3 (1854)–Fl. Brit. Ind. **5**: 657 (1888).

C. circinalis subsp. *vera* var. 2. *pectinata* (Griff.) Schuster in Pfl.-reich IV–1, Ht. **99**: 68 (1932).

Ranga Pani–Ghorwa, 400–300 m (Dec. 9, 1963); Ghorwa–Sanichare, 300–200 m (Dec. 10, 1963).

Distr. Tropical E. Himalaya (Nepal, Sikkim), Khasia, Manipur, and Burma.

PODOCARPACEAE (by Hiroshi Hara)

Podocarpus neriifolius D. Don in Lambert, Pinus ed. 1, **2**: 21 (1824)–Fl. Brit. Ind. **5**: 649 (1888)–Pilger in Pfl.-reich IV–5, Ht. **18**: 80 (1903)–N. E. Gray in Journ. Arn. Arb. **39**: 461 (1958)–S.-Y. Hu in Taiwania **10**: 36 (1964).

P. macrophylla (non D. Don 1824) Wallich, Tent. Fl. Napal. 56, t. 43 (1826), excl. syn.

Namli, Sikkim, 700 m (Mar. 25, 1963, fr.).

Distr. E. Himalaya (Nepal, Sikkim), Khasia, N. Burma, east to W. & S. China, Formosa, and Malaysia south to New Guinea and Fiji.

TAXACEAE (by Yoshisuke Satake)

Taxus baccata L., Sp. Pl. ed. 1, **2**: 1040 (1753).

subsp. **Wallichiana** (Zucc.) Pilger in Pfl.-reich IV–5, Ht. **18**: 112 (1903); in Pfl.-fam. ed. 2, **13**: 210 (1926).

T. Wallichiana Zucc. in Abh. Bayer. Akad. Wiss. **3**: 803, t. 5 (1843)–S.-Y. Hu in Taiwania **10**: 22 (1964).

T. baccata L. sensu Hook. f., Fl. Brit. Ind. **5**: 648 (1888).

Batasi, 2000 m (May 2, 1960, young fr.); Rimbick, 2200 m (May 6, 1960, young fr.); Bilbatay Bhanjang–Minchin Dhap, 2700–2900 m (Oct. 28, 1963, young fr.); Minchin Dhap-Mul Pokhari, 2900–2500 m (Oct. 29, 1963, young fr.); Taplejung, 1900 m (Nov. 2, 1963, young fr.); Selap-Walunchung Gola, 2600–3800 m (Nov. 10, 1963, young fr.); Baroya Khimty, 2500 m (Nov. 11, 1963, young fr.); Helok–Baroya Khimty, 1500–2500 m (Nov. 15, 1963, young fr.); Batasay–Bhuspate Danra, 2400–2800 m (Dec. 1, 1963, young male fl. and young fr.); Bhuspate Danra, 2800 m (Dec. 2, 1963, fr.).

Distr. E. Afghanistan, Himalaya, Khasia, N. Burma, Indo-China, W. China, and Malaysia.

PINACEAE (by Yoshisuke Satake)

Abies spectabilis (D. Don) Spach, Hist. Nat. Vég. Phaner. **11**: 422 (1842)–Rehder, Bibl. 9 (1949)–S.-Y. Hu in Taiwania **10**: 47 (1964). [Pl. 2 a]

Pinus spectabilis D. Don in Lambert, Pinus **2**: 3, t. 2 (1824)–D. Don, Prodr. Fl. Nepal. 55 (1825).

Abies Webbiana Lindl. in Penny Cyclop. **1**: 30 (1833)–Fl. Brit. Ind. **5**: 654 (1888).

Kurseong, 1600 m (Apr. 12, 1960, male fl.); Ramam–Phalut, 2400–3500 m (May 9, 1960, cones); Bakkim–Jongri, 2800–4000 m (May 19, 1960, cones); Preig Chu–Jongri (May 19, 1960); Jongri–Olothang (May 23, 1960, cones); Jongri, 4000 m (May 23, 1960); Jongri–Gamothang, 3600–4200 m (May 26, 1960, male fl.); Gamothang, 3800 m (May 26, 1960, male fl.); Migothang, 4200 m (May 31, 1960, male fl.); Walunchung Gola–Zongi, 3800-2800 m (Nov. 11, 1963, cones).

Distr. Afghanistan, Himalaya (Kashmir to Bhutan), and Tibet.

The hairiness of young branches is variable from nearly glabrous to densely pubescent. The present fir is related to *Abies Mariesii* Masters endemic to Japan in such characters as young branches covered with brownish hairs, marginal resin canals, and cones with concealed bract scales, so Masters casually referred *A. spectabilis* to *A. Mariesii* (see Curtis's Bot. Mag. t. 8098, 1906). The former is distinguished from the latter by longer and broader leaves, and larger winter buds and cones.

Pinus Roxburghii Sargent, Silva N. Amer. **11**: 9 (1897).

Pinus longifolia (non Salisb. 1796) Roxburgh, Fl. Ind. ed. 2, **3**: 651 (1832)–Fl. Brit. Ind. **5**: 652 (1890).

Pouwa, Kathmandu, 1600 m (Oct. 9, 1963); Dhankuta, 1200 m (Oct. 19 & 21, 1963, cones); Dumhan-Taplejung, 700–1900 m (Nov. 1, 1963); Khebang–Bharomdin, 1700–1000 m (Nov. 24, 1963).

Distr. Afghanistan, and Himalaya (Kashmir to Bhutan).

Tsuga dumosa (D. Don) Eichler in Engl., Pfl.-fam. II, **1**: 30 (1889)–Rehder, Bibl. 18 (1949). [Pl. 13 a]

Pinus dumosa D. Don, Prodr. Fl. Nepal. 55 (1825).

P. Brunoniana Wall., Pl. Asia. Rar. **3**: 24, t. 247 (1832).

Tsuga Brunoniana (Wall.) Carrière, Trait. Conif. 188 (1855)–Fl. Brit. Ind. **5**: 654 (1888).

Batasi, 2000 m (May 2, 1960, cones); Ramam–Phalut, 2400–3500 m (May 9, 1960, cones); Preig Chu–Jongri, 2500–4000 m (May 19, 1960, cones); Minchin Dhap–Mul Pokhari, 2900–2500 m (Oct. 29, 1963, cones); Iladanda–Selap, 1800–2600 m (Nov. 9, 1963, cones); Selap–Walunchung Gola, 2600–3800 m (Nov. 10, 1963, cones); Helok–Baroya Khimty, 1500–2500 m (Nov. 15, 1963, cones); Bhuspate Danra, 2800 m (Dec. 2, 1963, cones).

Dist. Himalaya (Kumaon to NEFA), and N. Burma.

It is interesting that the branchlets are nearly glabrous on the ventral side, but more or less pubescent on the dorsal side.

TAXODIACEAE (by Hiroshi Hara)

Cryptomeria japonica (L. f.) D. Don in Trans. Linn. Soc. **18**: 167, t. 13, f. 1 (1841)–Wilson, Conif. & Tax. Jap. 66 (1916); in Journ. Arn. Arb. **7**: 59 (1926)–Rehder, Bibl. 43 (1949)–S.-Y. Hu in Taiwania **10**: 51 (1964).

Cupressus japonica L. f., Suppl. Pl. 421 (1781).

Darjeeling, 2150 m, cult. (Apr. 2, 1960, fr.).

Distr. sp. Japan and China.

The species grows very fast in Eastern Himalaya, and its large trees are found here and there around villages. It is often afforested especially in the Darjeeling District, but its wood is said to be not well suited for construction, although in Japan it is one of the most valuable timbers.

CUPRESSACEAE (by Yoshisuke Satake)

Cupressus torulosa D. Don, Prodr. Fl. Nepal. 55 (1825)–Fl. Brit. Ind. **5**: 645 (1888)–S-Y. Hu in Taiwania **10**: 58 (1964).

Yoksam, 1780 m, cult. (May 17, 1960, cones); Gangtok, 1600 m, cult. (Jun. 16 & 17, 1960, cones); Biratnagar, 200 m, cult. (Oct. 15, 1963); Dhankuta, 1200 m (Oct. 19, 1963, cones); Illam, 1200 m (Dec. 7, 1963).

Distr. Himalaya (Kashmir to Sikkim), Indo-China, and W. China.

Juniperus communis L., Sp. Pl. ed. 1, **2**: 1040 (1753).

var. **saxatilis** Pallas, Fl. Ross. **1** (2): 12, t. 4, f. A (1788)–Rehder, Bibl. 58 (1949).

J. communis L. sensu Hook. f., Fl. Brit. Ind. **5**: 646 (1888).

Gamothang, 3750 m (May 29, 1960); Nayathang, 3300 m (Jun. 2, 1960).

Distr. Afghanistan, Himalaya, arctic and alpine regions of N. Hemisphere.

Juniperus squamata Hamilt. ex Lambert, Descr. Pinus **2**: 17 (1824)–Rehder, Man. ed. 2, 63 (1940); Bibl. 58 (1949). [Pl. 14 a]

J. recurva Hamilt. var. *squamata* (Hamilt.) Parlatore in DC., Prodr. **16** (2): 482 (1868)–Fl. Brit. Ind. **5**: 647 (1888).

Jongri, 4200 m (May 22, 1960, cones); Jongri–Olothang, 3600–4200 m (May 23, 1960); Jongri–Gamothang, 3600–4200 m (May 26, 1960, male fl. and cones); Migothang, 4200 m (May 31, 1960, cones).

Distr. Afghanistan, Himalaya (Sikkim, Bhutan), N. Burma, and W. China.

Juniperus Wallichiana [Hook. f. et Thoms. ex Parl. in DC., Prodr. **16** (2): 482 (1868), pro syn.] Brandis, For. Fl. Ind. 537 (1874)–Rehder, Bibl. 59 (1949).

J. pseudosabina Fisch. et Mey. sensu Hook. f., Fl. Brit. Ind. **5**: 646 (1888).

Rimbick–Ramam, 1900–2400 m (May 7, 1960, cones); Jongri, 4000 m (May 22, 1960); Jongri–Gamothang, 3800–4000 m (May 26, 1960, cones); Migothang, 3900 m (May 31, 1960, cones); Phalut–Sandakphu, 3300–3500 m (Jun. 6, 1960).

Distr. Karakoram, Himalaya, Tibet, and W. China.

ANGIOSPERMAE—DICOTYLEDONEAE

SAURURACEAE (by Hiroshi Hara)

Houttuynia cordata Thunberg in Vet. Acad. Stockholm Handl. **4**: 149, t. 5 (1783), ut *Houtuynia*; Fl. Jap. 234, t. 26 (1784)–Fl. Brit. Ind. **5**: 78 (1886).

Gangtok, 1650 m (Apr. 26 & Jun. 13, 14, 1960, fl.); Pamianchi–Tingling Bridge, 2000–1000 m (May 15, 1960); Kakani, 2100–2200 m (Sep. 24, 1963); Khebang–Bharomdin, 1500 m (Nov. 24, 1963).

Distr. Himalaya (Garhwal to Sikkim), Khasia, Manipur, Thai, Indo-China, China, Formosa, and Japan.

PIPERACEAE (by Hiroyoshi Ohashi)

Peperomia Heyneana Miquel, Syst. Pip. 123 (1843)–C. DC., Prodr. **16** (1): 453 (1869)–Hook. f., Fl. Brit. Ind. **5**: 99 (1886).

Ratong Chu, 1000 m (May 16, 1960, bud); Gangtok, 1600 m (Jun. 15, 1960, fl.); Gangtok–Saramsa Medicinal Garden (Jun. 17, 1960, fl.); Zalipur, Gangtok, 1000 m (Sep. 12, 1964, fr.); Peshok, 900 m (Jun. 19, 1960, fl.); Simkuna Bazar–Lopchu (Jun. 20, 1960, fl.); Ghatte–Khebang, 1600–2400 m (Nov. 19, 1963, fr.); Mai Majuwa–Dhara Pani, 1500–1900 m (Dec. 4, 1963, fr.).

Distr. Subtropical Himalaya (Kumaon to Sikkim), Khasia, and Assam.

Peperomia pellucida (L.) Humboldt, Bonpland et Kunth, Nov. Gen. **1**: 64 (1815)–Yuncker in Occ. Pap. Bishop Mus. **14**: 9 (1938)–Santapau in Rec. Bot. Suv. Ind. **16**: 203 (1960).

Piper pellucidum L., Sp. Pl. ed. 1, 30 (1753).

Piper exiguum Blume in Verh. Bat. Genoots. **11**: 233 (1826).

Peperomia exigua (Bl.) Miquel, Syst. Pip. 77 (1843)–Fl. Brit. Ind. **5**: 97 (1886).

Darjeeling, 2100 m (Apr. 2, 1960, fl.); Biratnagar, 200 m (Oct. 14 & 15, 1963, fr.); Dumhan–Taplejung, 1900 m (Nov. 1, 1963, fr.); Ranga Pani–Ghorwa, 700–300 m (Dec. 9, 1963, fr.); below Chumbhati, 500 m (Sep. 10, 1964, fr.); Zalipur, Gangtok, 1000 m (Sep. 12, 1964, fr.).

Distr. Pantropic, a native of America.

Peperomia tetraphylla (Forst. f.) Hooker et Arnott, Bot. Beech. Voy. 96 (1832)–Yuncker in Brittonia **14**: 188 (1962).

Piper reflexum L. f., Suppl. Pl. 91 (1781).

Piper tetraphyllum Forster f., Prodr. 5 (1786).

Peperomia reflexa (L. f.) A. Dietrich, Sp. Pl. **1**: 180 (1831); non H. B. K. (1815)–Fl. Brit. Ind. **5**: 99 (1886).

Darjeeling, 2100 m (Apr. 2, 1960, fl.); Dentam, 1400 m (May 11, 1960, fl.); Chovar Gorge, south of Kathmandu, 1200 m (Sep. 21, 1963, fr.); Bilbatay Bhanjang, 2200 m (Oct. 25, 1963, fr.); Mul Pokhari–Gorzu Kosir, 2500–2100 m (Oct. 30, 1963, fr.); Dumhan–Taplejung, 1900 m (Nov. 1, 1963, fr.); Garhi Danra–Tuwa, 2200–1800 m, (Nov. 4, 1963, fr.); Taplethok–Helok, 1400–1500 m (Nov. 6, 1963, fr.); Baroya Khimty, 2500 m (Nov. 11, 1963, fr.); Iladanda–Helok, 1800–1500 m (Nov. 13, 1963, fr.); Ghatte–Khebang, 1600–2400 m (Nov. 19, 1963, fr.); Tharpu–Chyangthaphu, 1200–1300 m (Nov. 26, 1963, fr.).

Distr. Africa, subtropical Himalaya (Garhwal to N. Assam), Khasia, India, Ceylon, Indo-China, Malaysia, China, Australia, and America.

Piper boehmeriaefolium Wallich [Cat. no. 6654 A (1832), nom. nud.] ex C. DC., Prodr. **16** (1): 348 (1869)–Fl. Brit. Ind. **5**: 85 (1886).

Chavica boehmeriaefolium Miquel, Syst. Pip. 265 (1843).

Gangtok–Saramsa Medical Garden, 1100 m (Jun. 17, 1960, fl. ♀); Zalipur, Gangtok, 1000 m (Sep. 12, 1964, fr.).

Distr. Tropical E. Himalaya (Sikkim to Bhutan), Assam, Khasia, and Burma.

Piper longum L., Sp. Pl. ed. 1, 29 (1753)–C. DC., l.c. 355 (1869)–Fl. Brit. Ind. **5**: 83 (1886).

Ranga Pani–Ghorwa, 700–300 m (Dec. 9, 1963, fr.).

Distr. Tropical E. Himalaya (E. Nepal to N. Assam), India, Ceylon, Malacca, and Malaysia.

Piper Mullesua D. Don, Prodr. Fl. Nepal. 20 (1825)–C. DC., l.c. 390 (1869).

P. Guigual D. Don, l.c. 20 (1825).

Chavica Mullesua (D. Don) Miquel, Syst. Pip. 280 (1843).

C. sphaerostachya Miquel, l.c. 279 (1843)–C. DC., l.c. 388 (1869).

P. brachystachyum Wallich [Cat. no. 6656 (1832), nom. nud., p. p.] ex Fl. Brit. Ind. **5**: 87 (1886).

Kurseong, 1550 m (Apr. 12, 1960, no. 788, fl. ♂); Rimbick–Raman, 1900–2400 m (May 7, 1960, fl. ♂); Pamianchi, 2000 m (May 14, 1960, fl. ♀); Yoksam–Bakkim, 1700–2200 m (May 18, 1960, fl. ♀); Tingling Bridge–Yoksam, 1000–1700 m (May 16, 1960, fl. ♂); Tuwa–Taplethok, 1800–1400 m (Nov. 5, 1963, fr.); Ghatte, 1300 m (Nov. 18, 1963, fr.); Ghatte–Khebang, 1600–2400 m (Nov. 19, 1963, fr.); Khebang, 1700 m (Nov. 21, 1963, fr.); below Siling Tzokupa–Siling Tzokupa (Nov. 21, 1963, fr.); Khebang–Bharomdin, 1700–1000 m (Nov. 24, 1963, fl. ♂).

Distr. Subtropical Himalaya (Simla to Bhutan), Khasia, and Nilghiri Hills.

Piper nepalense Miquel, Syst. Pip. 318 (1843)–Hook. f., l.c. 89 (1886).

Peshok 900 m (Apr. 27, 1960, fl.); Batasi, 2000 m (May 2, 1960, fr.); Dentam–Pamianchi, 1500–2000 m (May 12, 1960, fl. ♂); Tingling Bridge–Yoksam, 1000–1700 m (May 16, 1960, no. 324, fl. ♀); Orchid Sanctuary, Gangtok, 1500 m (Mar. 18, 1963).

Distr. Subtropical Himalaya (Garhwal to Bhutan), Khasia, and Mishmi.

Piper peepuloides Roxburgh [Hort. Beng. 4 (1814), nom. nud.] Fl. Ind. ed. Carey, **1**: 159 (1820)–Fl. Brit. Ind. **5**: 83 (1886).

Khebang–Bharomdin, 1700–1000 m (Nov. 24, 1963, fl. ♀); Tharpu–Chyangthaphu, 1200–1300 m (Nov. 26, 1963, fl. ♀); Illam–Ranga Pani, 1200–400 m (Dec. 8, 1963, fl. ♀).

Distr. Tropical Himalaya (Nepal to Bhutan), Assam, Khasia, and Chittagong.

Piper Wallichii (Miq.) Handel-Mazzetti, Symb. Sin. **7**: 155 (1929).

Chavica Wallichii Miquel, Syst. Pip. 254 (1843).

P. aurantiacum Wallich [Cat. no. 6658 A (1832), nom. nud.] ex C. DC., Prodr. **16** (1): 357 (1869)–Fl. Brit. Ind. **5**: 86 (1886).

Zongi–Iladanda, 2800–1800 m (Nov. 12, 1963); below Siling Tzokupa–Siling Tzokupa (Nov. 21, 1963); Illam–Ranga Pani, 1200–700 m (Dec. 8, 1963, fr.).

Distr. E. Himalaya (Nepal), Assam, and W. China.

CHLORANTHACEAE (by Hiroshi Hara)

Chloranthus officinalis Blume, Enum. Pl. Jav. 79 (1827); Fl. Jav. Chlor. 10, t. 1 (1828)–Fl. Brit. Ind. **5**: 100 (1886), p.p.–Merrill, Enum. Philip. Pl. **2**: 21 (1923)–Metcalf, Fl. Fukien **1**: 39 (1942).

Rayang, 250 m (Apr. 22, 1960, no. 1826, bud); Illam–Ranga Pani (Dec. 8, 1963, fr.); Ranga Pani–Ghorwa, 700–300 m (Dec. 9, 1963, fr. white).

Distr. Tropical Himalaya (Nepal to Bhutan), Assam, south to Malaysia, and east to W. China.

SALICACEAE (by Arika Kimura)

Populus ciliata Wallich ex Royle, Ill. Bot. Himal. 346, t. 98 (84 a), f. 1 (1839)–Wesmael in DC., Prodr. **16** (2): 329 (1868)–Brandis, Forest Fl. N. W. & C. Ind. 475 (1874), p.p.; Ind. Trees 640 (1906), p.p.–Fl. Brit. Ind. **5**: 638 (1888)–Dode in Mém. Soc. Hist. Nat. Autun **18** (Extr. Monog. Inéd. Populus, 65, t. 12, f. 109) (1905)–Gombocz in Math. Termész. Közl. **30**: 116 (1908)–Schneider in Pl. Wilson. **3**: 31 (1916)–Kirtikar & Basu, Ind. Med. Pl. **2**: 1222, t. 920 (1918)–Hand.-Mzt., Symb. Sin. **7**: 57 (1929)–Merrill in Brittonia **4**: 36 (1941).

Populus pyriformis Royle, Ill. Bot. Himal. 344 (1839), nom. nud.

Populus rotundifolia Griffith, Itin. Notes 172 (1848); Notul. Pl. Asiat. **4**: 382 (1854); Icon. Pl. Asiat. t. 546 (1854).

Populus balsamifera (non L.) Wesmael in Bull. Soc. Bot. Belg. **26**: 379 (1886), fide Gombocz.

Minchin Dhap–Mul Pokhari, 2700 m (Oct. 29, 1963); Baroya Khimty–Thakma Khola, 2500–3200 m (Nov. 12, 1963); Thakma Khola, 3200 m (Nov. 13, 1963); Akasay–Batasay, 2000–2400 m (Nov. 30, 1963).

Distr. Himalaya (Kashmir, Nepal, Sikkim, Bhutan), N. Burma, and W. China (Yunnan).

Salix babylonica L., Sp. Pl. ed. 1, **2**: 1017 (1753)–Fl. Brit. Ind. **5**: 629 (1888)–Brandis, Ind. Trees 637 (1906).

Darjeeling, Lloyd Bot. Gard., cult., 2100 m (Apr. 1, 1960); Kathmandu, 1600 m (Sep. 23, 1963); Iladanda–Helok, 1800–1500 m (Nov. 13, 1963).

Distr. Long known in cultivation in temperate regions, and thought to be native to China.

Salix ovatomicrophylla Hao in Fedde, Rep. Beih. **93**: 53 (1936).

Gamothang–Migothang, 3800–4400 m (May 30, 1960); Migothang, 3900 m (May 31, 1960.)

Distr. E. Himalaya (Sikkim), and W. China (Yunnan).

Salix (subgen. Protitea[1]) **plectilis** Kimura, sp. nov. [Pl. 17 b]

Arbor? Ramuli hornotini pilis cinereis brevibus directione variis molliter velutino-tomentosi 1.5–2.0 mm crassi; annotini teretes elongati fuligineo-fusci in sicco longitudine corrugati, fere undique vel partim vestigiis tomenti residuis tecti, 3–5 mm crassi; biennes fere glabri circ. 6 mm crassi. Gemmae tantum juveniles in axillis foliorum visae, ovato-oblongae apice obtusae, dense sericeo-pubescentes, 2.5–3.5 mm longae 1.0–2.0 mm latae; perula gemmali ventre libera, marginibus imbricatis. Folia adulta superiora chartacea, interstitiis 1.5–3.5 cm longis dissita, exsiccatione supra fuscescentia lucida infra pallidiora, elliptica, late elliptica vel oblongo-elliptica (suprema interdum lanceolato-oblonga), antice late acuta vel subrotundata, summo apice breviter subproducto-acuminata raro sensim acuminata, basi late acuta ad rotundata rarius subcordata, plerumque ad medium latiora, margine integra vel obsolete crenata vel crenato-serrulata, utrinque sub lente pilis adpressis dispersa vel interdum laxe sericea (supra demum glabrescentia?), 7.0–14.5 cm longa, 3.7–6.6 cm lata; costa mediana supra convexa subtus elevata, exsiccatione luteo-brunnea, utrinque inferne pilis minutis tomentosa superne laxe pubescente; nervis primariis utrinsecus 12–14, supra convexis infra prominentibus, leviter arcuatis et parallelis, a costa sub angulis 50°–70° divergentibus ante marginem flexuosis ascendentibusque; intermediis 1–2, quorum superioribus longioribus, primariis fere parallelis vel angulis sat latioribus divergentibus. Petioli cinereo-tomentosi supra sulcati 1.5–2.5 cm longi eglandulosi. Folia adulta inferiora minora late elliptica vel obovato-elliptica. Folia recentissima e vernatione relaxata utrinque dense sericea. Stipulae plerumque oblique ovatae apice acuminatae, interdum oblique ovato-lanceolatae, margine fere integrae vel obsoletissime crenato-serrulatae, utrinque pubescentes, 4–9 mm longae 1.5–4.2 mm latae. Amenta tantum fructifera visa, longe cylindrica patentia rectiuscula foliato-pedunculata, 8.5–11 cm longa, 1.3–1.9 cm crassa, capsulis remotis, rhachi visibili cinereo-tomentosa medio circ. 1.5 mm crassa; pedunculis cinereoto-mentosis 1.3–3.2 (–4.5) cm longis. Folia pedunculorum 2–5, petiolata, elliptica ad obovata, apice acuta ad rotundata vel cuspidato-rotundata, basi acuta vel obtusa, (1.1–) 1.7–5.5 (–6.8) cm longa 0.7–2.8 (–3.6) cm lata, utrinque (subtus plerumque densius) sericeo-pubescentia. Flores ♀ inter fructus remanentes: bracteolae concolores subpersistentes exsiccatione pallide brunneae, ovales vel ellipticae apice obtusissimae, extus convexae intus concavae, utrinque cinereo-tomentosae, in expansione circ. 1.3–1.5 mm longae 0.9–1.1 mm latae. Glandula ventralis carnosa crassa late obovato-rectangularis apice truncata vel truncato-rotundata, circ. 0.4–0.5 mm longa 0.6 mm lata, basin pedicelli semiamplectens. Glandula dorsalis nulla vel minima globulosa evoluta. Ovaria glabra ex ovata basi conica apice obtusa circ. 3 mm longa 1.3 mm crassa; pedicellis pilosis 1.3–1.5 mm longis bracteolas superantibus; stylis brevibus crassis obcompressis circ. 0.25–0.3 mm longis. Stigmata brevia carinalia subintegra. Capsulae in maturitate glaberrimae fuscae ex ovata basi longe conicae, circ. 5.0–5.6 mm longae, lateraliter 2.0–2.3 mm dorsiventraliter 2.3–2.5 mm crassae; pedicellis 2.8–3.5 mm longis, pilosis vel fere glabris. Ovula quaque in placenta 2.

E. Nepal: Mahara Bahara–Gauriganja–Kathgara, 200 m (H. Kanai, G. Murata, M. Togashi, Dec. 13, 1963—Typus in TI); Kathgara–Rangali, 200 m (Dec. 14, 1963).

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[1] *Salix* subgen. Protitea Kimura in Bot. Mag. Tokyo **42**: 290 (1928); in Engl., Bot. Jahrb. **62**: Literaturber. 69 (1929).

Distr. Endemic to E. Nepal.

Sine dubio *S. pyrinae* Wall. affinis, distat tamen foliis majoribus plerumque ellipticis nec lanceolatis, petiolis longioribus, stipulis oblique ovatis nec lanceolato-linearibus, pedunculorum foliis non minutis capsulisque apice obtusis nec acutis. Haec Protitea ovulis quaque in placenta tantum 2 distinctissima.

Salix pseudocalyculata Kimura, sp. nov. [Pl. 17 a]

Fruticulus humilis circ. 10 cm altus, trunco subterraneo radicante ad 1.0 cm crasso; ramis patentibus glabris brunneis ramulosis. Ramuli annotini erecto-patentes rectiusculi vel curvuli glabri brunnei, 4–8.5 cm longi, 1.5–2.5 mm crassi; hornotini recti glabri foliosi. Folia papyracea, elliptica vel obovata vel obovato-elliptica, ad vel supra medium latiora, apice subrotunda, obtusissima vel late acutiuscula, basi obtusa, margine crenato-serrulata, exsiccatione supra sub lente minute rugulosa subtus pallidiora, utrinque glaberrima, 13–15 mm longa, 8–8.5 mm lata; costa mediana supra impressa subtus elevata utrinque glabra; nervis primariis leviter arcuatis, supra fere planis vel impressiusculis, subtus paullo elevatis, utroque latere 6–7. Petioli glabri supra canaliculati, 2.5–5 mm longi. Stipulae minutissimae falcatae superne valde incurvatae apice obtusissimae ad 1 mm longae. Cataphylla subtus adpresse villosa. Amenta (paullo ante anthesin?) tantum ♂ visa, coaetanea, foliis superioribus subocculta, elliptica apice obtusa pluriflora, 0.8–1.0 cm longa, 5–6 mm crassa, ramulos glabros 6–10-foliatos 2–4 cm longos terminantia, rhachi glabra. Bracteolae concolores spatulato- vel cuneato-obovatae, apice subrotundae integrae vel leviter undulatae, utrinque glaberrimae vel rarius margine superno ciliolatae, 4.0–4.3 mm longae 2.0–2.6 mm latae. Glandulae 2, ventralis et dorsalis, plerumque subrectangulo-obovatae, carnosae, apice undulatim truncatae vel lobulatae, saepissime connatae (saltem latere uno) et quasi pseudodiscum formantes, 0.5–0.6 mm longae ac latae. Stamina 2, saepissime autem tantum 1 (haud duo connata), filamentis liberis glabris 2–3 mm longis, bracteolis fere aequilongis vel brevioribus. Antherae ovatae 1.2–1.3 mm longae et 1.0 mm latae, exsiccatione fuscae (in vivo purpurascentes?).

Sikkim: Gamothang, 3800 m (H. Hara, H. Kanai, G. Murata, M. Togashi & T. Tuyama, May 29, 1960, no. 551—Typus in TI).

Distr. Endemic to Sikkim.

S. calyculatae Hook. f. arcte affinis, sed foliis tenuioribus ab initio glaberrimis, floribus plerumque monandris, glandularum forma satis aliena longius distat.

Salix (subgen. Protitea) **pyrina** Wallich ex Andersson in Svensk. Vetensk. Akad. Handl. **1850**: 486 (1851); **6**: 4 (1867); in DC., Prodr. **16** (2): 193 (1868)–Schneider in Pl. Wilson. **3**: 95 (1916)–Hao in Fedde, Rep. Beih. **93**: 44 (1936).

Salix tetrasperma Roxb. var. *pyrina* Andersson in Journ. Linn. Soc. **4**: 41 (1860)–Fl. Brit. Ind. **5**: 627 (1888), p.p.

Rangali–Biratnagar, 200 m (Dec. 15, 1963).

Distr. E. Himalaya (Nepal), Thai, and China (Yunnan).

A typica paullum recedere videtur foliis omnino integerrimis (nec undulatis) fere ad medium (nec paullo infra medium) latioribus. Haec Protitea ovulis quaque in placenta 2 distinctissima.

Salix salwinensis Handel-Mazzetti ex Enander in Anz. Akad. Wiss. Wien, Math.-Nat. **63**: 95 (1926)–Hand.-Mzt., Symb. Sin. **7**: 75 (1929)–Hao in Fedde, Rep. Beih. **93**: 94, t. 34, f. 68 (1936).

Sandakphu–Phalut, 3300–3600 m (May 8 & Jun. 6, 1960); Ramam–Phalut (May 9,

1960); Phalut, 3500 m (Jun. 5, 1960); Sandakphu–Garibans, 3600–2800 m (Jun. 7, 1960).

Distr. E. Himalaya (Singalila), and W. China (Yunnan).

Salix sikkimensis Andersson in DC., Prodr. **16** (2): 269 (1868)–Fl. Brit. Ind. **5**: 632 (1888)–Brandis, Ind. Trees 638 (1906)–Schneider in Pl. Wilson. **3**: 115 (1916)–Hao in Fedde, Rep. Beih. **93**: 90, t. 33, f. 65 (1936)–Spring Fl. Sikkim Himal. f. 79 (1963).

Yoksam–Bakkim, 1700–2200 m (May 18, 1960); Jongri, 4000 m (May 23, 1960); Gamothang, 3800 m (May 27 & 29, 1960).

Distr. E. Himalaya (Sikkim), Bengal, and W. China (Yunnan).

Salix Wallichiana Andersson in Svensk. Vetensk. Akad. Handl. **1850**: 477 (1851); in Journ. Linn. Soc. **4**: 50 (1860); in Svensk. Vetensk. Akad. Handl. **6**: 80, t. 5, f. 46 (1867); in DC., Prodr. **16** (2): 223 (1868)–Brandis, Forest Fl. N.-W. & C. Ind. 468, t. 61 (1874); Ind. Trees 637 (1906)–Fl. Brit. Ind. **5**: 628 (1888)–Schneider in Pl. Wilson. **3**: 64 (1916)–Hand.-Mzt., Symb. Sin. **7**: 87 (1929)–Hao in Fedde, Rep. Beih. **93**: 92 (1936).

Salix grisea Wallich, Cat. no. 3700 (1829), nom. nud.

Salix pachyclada Léveillé & Vaniot in Fedde, Rep. **3**: 22 (1906).

Salix funebris Léveillé in Fedde, Rep. **12**: 287 (1913).

Salix Mairei Léveillé in Fedde, Rep. **13**: 342 (1914).

Helok, 1500 m (Nov. 8, 1963); Helok–Iladanda, 1500–1800 m (Nov. 8, 1963); above Helok (Nov. 9, 1963).

Distr. Afghanistan, Himalaya (Kashmir, Punjab, Nepal, Bhutan), N. Burma, and China (Szechuan, Kweichow, Yunnan, Kansu, Hupeh).

MYRICACEAE (by Hiroshi Hara)

Myrica esculenta Hamilton ex D. Don, Prodr. Fl. Nepal. 56 (1825)–Wilson in Pl. Wilson. **3**: 189, in nota (1916)–Merrill in Brittonia **4**: 35 (1941)–Fl. Males. **4**: 278 (1951).

M. sapida Wallich, Tent. Fl. Napal. 59, t. 45 (1826).

M. Nagi Thunb. sensu Fl. Brit. Ind. **5**: 597 (1888), p.p.

Godavari, Kathmandu, 1500 m (Sep. 18, 1963, fl.); Pouwa, 1600 m (Oct. 9, 1963, fl.); above Helok, 1600 m (Nov. 8, 1963, fl.); Yamphodin–Ghatte, 2100–1600 m (Nov. 18, 1963, fl.).

Distr. Himalaya (Kashmir to Sikkim), India, Burma, Indo-China, W. & S. China, and Malaysia.

The species has densely pubescent branches, petioles and rachises of inflorescence, generally compound male spikes, and ciliate bracts. It resembles *Myrica rubra* Sieb. et Zucc. of Japan and China, but in the latter, the branches, petioles, and inflorescences are quite glabrous, the male spikes are simple, and the fruits are often larger and 12–15 mm across.

JUGLANDACEAE (by Hiroshi Hara)

Engelhardia spicata Lechenault ex Blume, Bijdr. 528 (1825)–Fl. Brit. Ind. **5**: 595 (1888)–Fl. Males. **6**: 151 (1960)–Manning in Bull. Torrey Bot. Cl. **93**: 41 (1966).

Takdah, 1600 m (Apr. 18, 1960, fr.); Dentam–Pamianchi, 1500–2000 m (May 12, 1960, no. 211, fr.); Taplejung–Garhi Danra, 1900–2200 m (Nov. 3, 1963, fr.); Taplethok–Helok, 1400–1500 m (Nov. 6, 1963, fr.); Ghatte–Khebang, 2400–1700 m (Nov. 19, 1963, fr.); Illam–Ranga Pani, 1200–400 m (Dec. 8, 1963, fl.); Ranga Pani–Ghorwa, 700–300 m (Dec. 9, 1963, fr.).

Distr. Himalaya (Nepal to Bhutan), S. Tibet, Assam, Naga Hills, Manipur, E. Bengal, east to Indo-China and W. China (Yunnan), and Malaysia.

The size of fruits is exceedingly variable, and the wing is 1.5–4.5 cm long. The specimens from Garhi Danra and Helok are referrable to var. *aceriflora* Kds. et Val.

Juglans regia L., Sp. Pl. ed. 1, **2**: 997 (1753)–Fl. Brit. Ind. **5**: 595 (1888).

var. **kamaonia** C. DC. in Ann. Sci. Nat. ser. 4, **18**: 32 & 33 (1862); Prodr. **16** (2): 136 (1864)–Kitamura, Faun. & Fl. Nepal Himal. 105 (1955).

J. kamaonia (C. DC.) Dode in Bull. Soc. Dendr. France **2**: 86, figs. (1906).

Palmajua, 2200 m (May 4, 1960, no. 68, fl. & fr.).

Dist. var. Himalaya (Kashmir to Bhutan), Khasia, and S. Tibet.

BETULACEAE (by Hiroshi Hara)

Alnus nepalensis D. Don, Prodr. Fl. Nepal. 58 (1825)–Wall., Pl. Asia. Rar. **2**: 27, t. 131 (1831)–Fl. Brit. Ind. **5**: 600 (1888)–Winkler in Pfl.-reich IV–61, Ht. **19**: 108, f. 25 (1904).

Palmajua–Rimbick, 1500–2200 m (May 5, 1960, no. 151, fr.); Sunderijal Waterfall, 1600 m (Sep. 20, 1963, bud); Gokarna, 1500 m (Sep. 22, 1963, bud); Dhankuta, 1200 m (Oct. 18 & 19, 1963, fl.); Dumhan–Taplejung, 1400 m (Nov. 1, 1963, fl.); Helok–Baroya Khimty, 1500–2500 m (Nov. 10, 1963).

Distr. Himalaya (Garhwal to Sikkim), Khasia, Manipur, Naga Hills, and W. China.

Betula alnoides Hamilton ex D. Don, Prodr. Fl. Nepal. 58 (1825)–Fl. Brit. Ind. **5**: 599 (1888), p.p.–Schneider in Pl. Wilson. **2**: 467 (1916)–Merrill in Brittonia **4**: 37 (1941).

B. acuminata (non Ehrhart 1791) Wallich, Pl. Asia. Rar. **2**: 7, t. 109 (1831)–Regel, Monogr. Betul. 129 & 130, t. 6, f. 29–31, t. 13, f. 29 (1861), *α. glabra, pilosa, arguta*, et *lancifolia.*

B. cylindrostachys β. pilosa et *γ. subglabra* Regel in DC., Prodr. **16** (2): 189 (1868).

B. alnoides var. *acuminata* Winkler, l.c. 89, f. 22 A–C (1904).

Birch Hill, Darjeeling, 2000 m (Apr. 4, 1960); Gangtok, 1650 m (Apr. 26 & Jun. 13, 1960); Pouwa, Kathmandu, 1600 m (Oct. 9, 1963); Garhi Danra–Tuwa, 1800–2200 m (Nov. 4, 1963).

Distr. E. Himalaya, Khasia, Manipur, S. Tibet, Burma, Thai, Indo-China, and W. China.

Betula utilis D. Don, Prodr. Fl. Nepal. 58 (1825)–Fl. Brit. Ind. **5**: 599 (1888), p.p.–Winkler, l.c. 61 (1904), p.p.–Schneider in Pl. Wilson. **2**: 474 (1916).

B. Bhojhattra Wallich, Pl. Asia. Rar. **2**: 7 (1831)–Regel, Monogr. Betul. 59, t. 13, f. 7–12 (1861), p.p.

Ramam–Phalut, 2400–3500 m (May 9, 1960, no. 166, fr.); Bakkim–Jongri, 2500–4000 m (May 20, 1960, fr.); Gamothang, 3800 m (May 29, 1960, no. 573 & 550, fl.); Phalut, 3500 m (Jun. 4, 1960, no. 644); Hati Sar–Minchin Dhap, 2700–2900 m (Oct. 28, 1963).

Distr. E. Himalaya (Nepal to Bhutan).

The relationship between *B. utilis* and *B. Jacquemontii* Spach of W. Himalaya was discussed by Kitamura in his Pl. W. Pakistan and Afghan. 36–38 (1964).

Carpinus viminea Wallich, Pl. Asia. Rar. **2**: 4, t. 106 (1831)–Fl. Brit. Ind. **5**: 626 (1888)–Winkler, l.c. 32, f. 12, C, D (1904)–Schneider, l.c. 437 (1916).

Rimbick–Ramam, 1900–2400 m (May 7, 1960, no. 102); Yoksam–Bakkim (May 18, 1960); Rabong La–Temi, lower road, 1200 m (May 28, 1963, fl.); Iladanda–Selap, 1800–2600 m (Nov. 9, 1963, fr.); Zongi–Iladanda (Nov. 12, 1963).

Distr. Himalaya (Punjab to Sikkim), Khasia, N. Burma, Indo-China, and S. China.

Corylus ferox Wallich, Pl. Asia. Rar. **1**: 77, t. 87 (1830)–Fl. Brit. Ind. **5**: 625 (1888)–Winkler, l.c. 44, f. 13 (1904)–Schneider, l.c. 448 (1916).

Minchin Dhap–Mul Pokhari, 2900–2500 m (Oct. 29, 1963, fl.); Helok, 1500 m (Nov. 9, 1963); Selap–Walunchung Gola, 2600–3800 m (Nov. 10, 1963, fl.); Baroya Khimty–Thakma Khola, 2600 m (Nov. 12 & 16, 1963, fl.); Bhandukay Bhanjang, 3100 m (Dec. 3, 1963, fl.).

Distr. E. Himalaya (Nepal, Sikkim).

FAGACEAE (by Hiroo Kanai)

Castanopsis indica (Roxb.) A. DC. in Journ. Bot. **1**: 182 (1863)–Fl. Brit. Ind. **5**: 620 (1888)–Camus, Les Chataigners 280 (1929).

Castanea indica Roxb. [Hort. Beng. 68 (1814), nom. nud.] Fl. Ind. ed. 2, **3**: 643 (1832).

Gangtok, 1600 m (Apr. 26, 1960); Pamianchi–Tingling Bridge, 2000–1000 m (May 15, 1960); Gangtok, 1500 m (Jun. 17, 1960, fl.); Rhenok, Sikkim, 1100 m (Mar. 19, 1963, fr.); Godavari, 1500 m (Sep. 18, 1963, fr.); Sunderijal, 1600 m (Sep. 20, 1963.); Mul Pokhari–Dumhan, 1300 m (Oct. 30, 1963, fl.); Taplejung–Heydewa, 1800 m (Nov. 3, 1963, ster.); Khebang–Bharomdin, 1300 m (Nov. 24, 1963, fl.); Bharomdin–Tharpu, 800 m (Nov. 25, 1963, fr.); Tharpu–near Chyangthaphu, 1100 m (Nov. 26, 1963, fl. & fr.); Chyangthaphu, 1200 m (Nov. 27, 1963, fl. & fr.).

Distr. Himalaya (Nepal to Bhutan), Assam, Burma, Bengal, Indo-China, Thai, and China (Yunnan, Hainan).

Castanopsis Hystrix A. DC. in Journ. Bot. **1**: 182 (1863)–Fl. Brit. Ind. **5**: 620 (1888)–Camus, Les Chataigners 290 (1929).

Kurseong, 1600 m (Apr. 12, 1960, fr.); Takdah, 1600 m (Apr. 19, 1960, fl.); Batasi, 2000 m (May 2, 1960, fl.); Rimbick, 2200 m (May 6, 1960, fl.); Rimbick–Ramam, 1900–2400 m (May 7, 1960, fl. & fr.); Dentam–Pamianchi, 2000 m (May 12, 1960, fl.); Pamianchi–Tingling Bridge, 2000–1000 m (May 15, 1960, fl.); Sinduwa, 2000 m (Oct. 24, 1963, fr.); Bilbatay Bhanjang, 2200 m (Oct. 25, 1963, fr.); Mul Pokhari–Gorzu Kosir, 2100 m (Oct. 30, 1963); Helok–Baroya Khimty, 2300 m (Nov. 10, 1963, fr.); Ghatte–Khebang, 2000 m (Nov. 19, 1963, fr.); Birwa, 2000 m (Nov. 27, 1963, fr.); Yektin–Akasay, 1700 m (Nov. 30, 1963, fr.); Mai Pokhari, 1600 m (Dec. 4, 1963, fr.).

Distr. Himalaya (Nepal to Bhutan), Assam, Burma, Indo-China, S. China, and Formosa.

Castanopsis tribuloides (Smith) A. DC. in Journ. Bot. **1**: 182 (1863)–Fl. Brit. Ind. **5**: 622 (1888)–Camus, Les Chataigners 382 (1929). [Pl. 10 b]

Quercus tribuloides Smith in Rees, Cyclop. **29**: no. 13 (1819).

Takdah, 1600–1700 m (Apr. 19, 1960, fl.); Batasi–Palmajuwa, 2100–2300 m (May 3, 1960, ster.); Dentam–Pamianchi, 1500–2000 m (May 12, 1960, fl.); Yoksam, 1700 m (May 17, 1960, fr. & fl.); Mul Pokhari–Gorzu Kosir, 2000 m (Oct. 30, 1963, fr.); Taplejung, 2000 m (Oct. 31, 1963, fr.); Dumhan–Taplejung, 1400 m (Nov. 1, 1963, fr.); Taplejung–Garhi Danra, 1900 m (Nov. 3, 1963, fr.); Helok, 1700 m (Nov. 8, 1963, fr.); Helok–Iladanda, 1800 m (Nov. 8, 1963, fr. & fl.); Bhandukay–Yamphodin, 2300 m (Nov. 16, 1963, fr.); Yamphodin–Ghatte, 1800 m (Nov. 18, 1963, fr.); Khebang, 2100 m (Nov. 19, 1963, ster.); Ghatte–Khebang, 2000 m (Nov. 19, 1963, fr.); Khebang–below Siling Tzokupa, 1800 m (Nov. 20, 1963 fr.); Chyangthaphu–Birwa, 1800 m (Nov. 27, 1963, fr.).

Distr. Himalaya (Kumaon to Sikkim), Assam, Burma, Indo-China, and W. China (Yunnan).

Quercus acutissima Carruth. in Journ. Linn. Soc. **6**: 33 (1861)–Camus, Les Chênes **1**: 571 (1936–38).

Q. serrata (non Thunb. 1784) Sieb. et Zucc. in Abh. Akad. Muench. **4** (3): 226 (1846)–Fl. Brit. Ind. **5**: 601 (1888).

Peshok, Darjeeling, 700 m (Mar. 31, 1960, fr.); Takdah, 1600 m (Apr. 19, 1960).

Distr. Himalaya (from Kumaon eastwards), Assam, Burma, Indo-China, China, Formosa, Korea, and Japan.

The shape and hairiness in leaf, and the size and shape of involucle are so variable that the two subspecies of Camus, ssp. *eu-acutissima* and ssp. *Roxburghii*, are hardly distinguishable.

Quercus fenestrata Roxb., Fl. Ind. ed. 2, **3**: 633 (1832)–Fl. Brit. Ind. **5**: 608 (1888).

Senchal, 2200 m (Apr. 6, 1960, fr.); Kurseong, 1600 m (Apr. 12, 1960, fr.); Takdah, 1600–1700 m (Apr. 19, 1960, fl.); Lopchu, 1500 m (Apr. 28, 1960, fl.).

Distr. E. Himalaya, Assam, and Burma.

Quercus glauca Thunb., Fl. Jap. 175 (1784)–Fl. Brit. Ind. **5**: 604 (1888)–Camus, Les Chênes **1**: 282 (1936–38)–Kitamura, Faun. & Fl. Nepal Himal. 107 (1955).

Orchid Sanctuary, Gangtok, 1500 m (Mar. 24, 1963, fl.); Godavari, 1500 m (Sep. 18, 1963, fr.); Taplethok–Helok, 1500 m (Nov. 6, 1963, fr.); Helok, 1500 & 1600 m (Nov. 7 & 8, 1963, fr.); Iladanda–Helok, 1800 m (Nov. 13, 1963, fr.); Yektin, 1100 m (Nov. 29, 1963).

Distr. Himalaya (Kashmir to Bhutan), Assam, Burma, Indo-China, China, Formosa, Korea (Quelpaert), and Japan.

Quercus incana Roxb. [Hort. Beng. 104 (1814), nom. nud.] Fl. Ind. ed. 2, **3**: 642 (1832)–Fl. Brit. Ind. **5**: 602 (1888).

Q. leucotricophora A. Camus in Riviera Scientif. **12**: 66 (1935).

Darjeeling, 2000 m (Apr. 14, 1960, fl.); Sanguri Bhanjang, 1200 m (Oct. 16, 1963); Dhankuta, 1200 m (Oct. 20, 1963,); Dumhan–Taplejung, 1200 m (Nov. 1, 1963,); Helok, 1500 m (Nov. 8, 1963); Iladanda, 2100 m (Nov. 6 & 8, 1963, fr.); below Siling Tzokupa–Siling Tzokupa, 2500 m (Nov. 21, 1963); Dhara Pani–Illam, 1300 m (Dec. 5, 1963).

Distr. Himalaya (Indus to Sikkim), Burma, Thai, and Indo-China.

Q. incana and *Q. lanata* Smith (*Q. lanuginosa* D. Don) are hardly distinguishable, though they are separated from each other by the color of leaf.

This species is apparently evergreen though King in Ann. Bot. Gard. Calcut. **2**: 26 (1889) mentioned it as deciduous.

Quercus lamellosa Smith in Rees, Cyclop. **29**: no. 23 (1819)–Fl. Brit. Ind. **5**: 606 (1888)–Camus, Les Chênes **1** : 322 (1936–38).

Senchal, 2400 m (Apr. 6, 1960); Takdah, 1600–1700 m (Apr. 19, 1960,); Batasi, 2150 m (May 1, 1960, st.); Palmajua, 2300 m (May 4, 1960, st.); Rimbick–Ramam, 2000 m (May, 7, 1960, fr. & fl.); Preig Chu–Jongri, 2800 m (May 19, 1960); Sinduwa, 2100 m (Oct. 24, 1963,); Minchin Dhap–Mul Pokhari, 2600 m (Oct. 29, 1963, fr.); Zongi–Iladanda, 2300 m (Nov. 12, 1963, leaf).

Distr. Himalaya (Nepal to Bhutan), Assam, Burma, Tibet, and China (Yunnan).

Quercus lanceaefolia Roxb., Fl. Ind. ed. 2, **3**: 634 (1832)–Fl. Brit. Ind. **5**: 616 (1888).

Castanopsis lanceaefolia (Roxb.) Hickel et A. Camus in Bull. Soc. Bot. France **68**: 394 (1921)–Camus, Les Chataigners 427 (1929).

Loohya Mai–Ghorwa, 300 m (Dec. 9, 1963, fl.).

Distr. Himalaya (Nepal to Bhutan), Bengal, Assam, Burma, and Thai.

Quercus lineata Bl., Bijdr. 523 (1825)–Fl. Brit. Ind. **5**: 605 (1888).

Rimbick–Ramam, 2000 m (May 7, 1960, fl.); Minchin Dhap–Mul Pokhari, 2600 m (Oct. 29, 1963,); Helok–Baroya Khimty, 2100 m (Nov. 10, 1963); Zongi–Iladanda, 2300 m (Nov. 12, 1963, fr.).

var. **Lobbi** Wenzig in Jahrb. Bot. Gart. Berlin **4**: 232 (1886)–King in Ann. Bot. Gard. Calcut. **2**: 33, pl. 26 (1889).

Q. Lobbi Ettinghausen in Sitzb. Akad. Wiss. Wien **87** (1): 402 (1883)–Camus, Les Chênes **1**: 256, pl. 1–13 (1936–38).

Minchin Dhap–Mul Pokhari, 2500 m (Oct. 29, 1963, fr.); Iladanda–Selap, 2400 m Nov. 9, 1963, fr.); Helok–Baroya Khimty, 2000 m (Nov. 10, 1963,); Zongi–Iladanda, 2300 m (Nov. 12, 1963, fr.).

var. **oxyodon** Wenzig in Jahrb. Bot. Gart. Berlin **4**: 232 (1886)–King in Ann. Bot. Gard. Calcut. **2**: 33, pl. 26 (1889).

Q. oxyodon Miq. in Ann. Mus. Bot. Lugd.-Bat. **1**: 114 (1865–64)–Camus, Les Chênes **1**: 216, pl. 1–8 (1936–38).

Ramam–Phalut, 2500 m (May 9, 1960, fl. & fr.); Iladanda–Selap, 2200 m (Nov. 9, 1963, fr.); Baroya Khimty, 2500 m (Nov. 11, 1963).

Distr. sp. Himalaya (from Nepal eastwards), Assam, Burma, Malay, and China.

The size and shape of leaf and acorns and the amount of hairiness of leaf vary greatly. There are many intermediate forms between this and *Q. glauca.*

Quercus pachyphylla Kurz in Journ. Asia. Soc. Beng. **2**: 197, t. 14, f. 1–4 (1875)–Fl. Brit. Ind. **5**: 608 (1888). [Pl. 10 c]

Senchal, 2200 m (Apr. 6, 1960, fr.); Senchal–Tiger Hill, 2400–2500 m (Jun. 2 & 3, 1960, fl.); Batasi–Palmajua, 2300–2600 m (May 3, 1960); Rimbick–Ramam, 1900–2400 m (May 7, 1960, fl.); Ramam–Samanden, 2300 m (May 9, 1960, fr.); Yoksam –below Bakkim, 2000 m (May 18, 1960, fr.); Bakkim–Jongri, 2700 m (May 19, 1960); Tendong Peak, 2800 m (Mar. 26, 1963,); Birwa–Yektin, 2300 m (Nov. 28, 1963); Yektin–Akasay, 2100 m (Nov. 30, 1963); Batasay–Halhare Bhanjang, 2500 m (Dec. 1, 1963, st.); Bhuspate Danra, 2600 m (Dec. 2, 1963, fr.).

Distr. E. Himalaya (Nepal, Sikkim), and Manipur.

Quercus semecarpifolia Smith in Rees, Cyclop. **29**: no. 20 (1819)-Fl. Brit. Ind. **5**: 601 (1888)-Camus, Les Chênes **1**: 391, pl. 36 (1936-38). [Pl. 2 b]

Birwa-Yektin, 2400 m (Nov. 28, 1963, fl.); Kaulepati Bhanjang, 1700 m (Nov. 28, 1963); Batasay-Halhale Bhanjang, 2500 m (Dec. 1, 1963, fl.).

Distr. E. Afghanistan, Himalaya, Assam, Burma, and China.

Quercus spicata Smith in Rees, Cyclop. **29**: no. 12 (1819)-Fl. Brit. Ind. **5**: 609 (1888).

Lithocarpus spicata (Smith) Rehd. et Wilson in Pl. Wilson. **2**: 207 (1916).

Yoksam, 1700 m (May 17, 1960, fr.); Iladanda-Selap, 2500 m (Nov. 9, 1963, fr.).

Distr. sp. Himalaya (Nepal to NEFA), Burma, Malaya, Thai, Indo-China, and W. China (Yunnan, Szechuan).

var. **brevipetiolata** DC., Prodr. **16** (2): 86 (1864)-Fl. Brit. Ind. **5**: 610 (1888).

Siliguri-Kurseong, 1300 m (Apr. 29, 1960, fl. & fr.).

Distr. var. Himalaya, and Khasia.

ULMACEAE (by Hiroshi Hara)

Celtis tetrandra Roxburgh, Fl. Ind. ed. 2, **2**: 63 (1832)-Planchon in DC., Prodr. **17**: 179 (1873)-Fl. Brit. Ind. **5**: 482 (1888).

Illam, 1200 m (Dec. 7, 1963, fr.).

Distr. Himalaya (Kumaon to Sikkim), Khasia, Deccan, Burma, and Malaysia. I doubt if *C. australis* L. is distributed in Eastern Himalaya.

Trema cannabina Loureiro, Fl. Cochinch. **2**: 563 (1790)-Merrill in Trans. Amer. Philos. Soc. n.s. **24** (2): 131 (1935)-de Wit in Bull. Bot. Gard. Buitenz. ser. 3, **18**: 192 (1949).

T. amboinensis (Willd.) Blume, Mus. Bot. Lugd.-Bat. **2**: 61 (1856)-Fl. Brit. Ind. **5**: 484 (1888).

T. orientalis var. *amboinensis* (Bl.) Lauterbach in Engl., Bot. Jahrb. **50**: 321 (1913).

Pamianchi-Tingling Bridge, 2000-1000 m (May 15, 1960, no. 263, fl.); Siling Tzokupa-Khebang, 2100-1700 m (Nov. 22, 1963, fl.); Dhara Pani-Illam, 1500-1200 m (Dec. 5, 1963).

Distr. Himalaya, India, Malaysia, east to S. China.

Trema orientalis (L.) Blume, Mus. Bot. Lugd.-Bat. **2**: 62 (1856)-Fl. Brit. Ind. **5**: 484 (1888)-Lauterbach, l.c. 320 (1913)-de Wit, l.c. 192 (1949)-Polhill in Kew Bull. **19**: 143 (1964).

Celtis orientalis L., Sp. Pl. ed. 1, **2**: 1044 (1753), p.p.

Malda-Siliguri, 200 m (Apr. 28, 1960, fl.).

Distr. Tropical Africa, Himalaya, India, Malaysia, east to W. & S. China and S. Japan, Australia, and Polynesia.

Trema politoria (Planch.) Blume, Mus. Bot. Lugd.-Bat. **2**: 58 (1856)-Fl. Brit. Ind. **5**: 484 (1888)-Lauterbach, l.c. 318 (1913).

Tamur Bridge-Dhankuta, 400 m (Oct. 17, 1963, fr.).

Distr. Subtropical Himalaya, and India.

Ulmus Wallichiana Planchon in Ann. Sci. Nat. ser. 3, **10**: 277 (1848)-Fl.

Brit. Ind. **5**: 480 (1888)-Schneider in Pl. Wilson. **3**: 250 (1916).

Above Helok, 1700 m (Nov. 8, 1963).

Distr. Himalaya (Kashmir to Nepal).

MORACEAE (by Hiroyoshi Ohashi)

Artocarpus integra (Thunb.) Merrill, Interpret. Herb. Amboin. 190 (1917)-Corner in Gard. Bull. Singap. **10**: 56, t. 1-2 (1939)-Jarrett in Journ. Arn. Arb. **40**: 329 (1959).

Radermachia integra Thunberg in Vet. Akad. Handl. Stockh. **37**: 254 (1776).

A. integrifolia L. f., Suppl. Pl. 412 (1781)-King in Fl. Brit. Ind. **5**: 541 (1888).

Khebang–Bharomdin, 1700–1000 m (Nov. 24, 1963); Illam–Ranga Pani, 1200–400 m (Dec. 8, 1963, fl.); Sanichare–Sibganja, 200 m (Dec. 11, 1963, fl.); Sibganja–Mahara Bahara, 200 m (Dec. 12, 1963, fl.).

Distr. Native of Malaysia, but now cultivated in most tropical countries.

Cannabis sativa L., Sp. Pl. ed. 1, 1027 (1753)-Fl. Brit. Ind. **5**: 487 (1888)-Backer in Fl. Males. **4** (3): 223, t. 1 (1951).

Dentam–Pamianchi, 1500–2000 m (May 12, 1960, fl. & fr.).

Distr. Native of C. Asia, now cultivated in many countries.

Ficus altissima Blume, Bijdr. 444 (1825)-King in Ann. Bot. Gard. Calcut. **1**: 30, t. 30–31 (1887); in Fl. Brit. Ind. **5**: 504 (1888).

Siliguri–Kurseong, 200–1500 m (Apr. 29, 1960, fl.).

Distr. E. Himalaya (Nepal to Bhutan), India, Ceylon, Burma, and Malaysia.

Ficus auriculata Loureiro, Fl. Cochinch. 666 (1790)-Corner in Gard. Bull. Singap. **18**: 33 (1960).

F. Roxburghii Wallich [Cat. no. 4508 (1831), nom. nud.] ex Miquel in Ann. Mus. Lugd.-Bat. **3**: 296 (1867)-King in Fl. Brit. Ind. **5**: 534 et in Ann. Bot. Gard. Calcut. **1**: 168, t. 211 (1888)-Hand.-Mzt., Symb. Sin. **7**: 100 (1929).

Palmajua–Rimbick, 1500–2200 m (May 5, 1960, fr.); Zongi–Iladanda, 2800–1800 m (Nov. 12, 1963, fr.); Ghatte–Khebang, 1600–2400 m (Nov. 19, 1963).

Distr. Himalaya (Indus to Bhutan), India, Burma, Indo-China, and China.

Ficus drupacea Thunberg, Diss. Ficus 6 & 11 (1786).

var. **pubescens** (Roth) Corner in Gard. Bull. Singap. **17**: 381 (1960).

F. mysorensis Heyne ex Roth et var. *pubescens* Roth in Roemer et Schultes, Syst. Veg. **1**: 508 (1817)-King in Ann. Bot. Gard. Calcut. **1**: 19, t. 14–15 (1887); in Fl. Brit. Ind. **5**: 500 (1888).

Pamianchi–Tingling Bridge, 2000–1000 m (May 15, 1960, no. 274, fl.); Tamur Bridge–Dhankuta (Oct. 17, 1963, fr.); Dhankuta, 1200 m (Oct. 19, 1963, fr.); Bharomdin–Tharpu, 700–1200 m (Nov. 25, 1963, fr.); Chyangthaphu–Birwa, 1300–2400 m (Nov. 27, 1963, fr.).

Distr. E, Himalaya (Sikkim, Bhutan), Khasia, Assam, Burma, and Indo-China.

Ficus hederacea Roxburgh, Fl. Ind. ed. 2, **3**: 538 (1832)-Corner, l.c. **18**: 18 (1960).

F. scandens Roxburgh, Fl. Ind. ed. 2, **3**: 536 (1832)-King in Ann. Bot. Gard. Calcut. **1**: 129, t. 162 et in Fl. Brit. Ind. **5**: 526 (1888).

Tharpu–near Chyangthaphu, 1200–1300 m (Nov. 26, 1963, fl.).

Distr. Himalaya (Kumaon to Bhutan), India, and Burma.

Ficus hispida L. f., Suppl. Pl. 442 (1781)–King in Fl. Brit. Ind. **5**: 522 et in Ann. Bot. Gard. Calcut. **1**: 116, t. 154–155 (1888)–Rehder in Journ. Arn. Arb. **10**: 126 (1929)–Corner, l.c. **18**: 39 & 40 (1960).

Ranga Pani–Ghorwa, 700–300 m (Dec. 9, 1963, fr.); Kathgara–Rangali, 200 m (Dec. 14, 1963, fr.).

Distr. Himalaya, India, Ceylon, Malaysia, Indo-China, China, and Australia.

Ficus neriifolia J. E. Smith in Rees, Cyclop. **14**: no. 21 (1810).

var. **nemoralis** (Wall. ex Miq.) Corner in Gard. Bull. Singap. **17**: 426 (1960).

F. nemoralis Wallich [Cat. no. 4517 (1831), nom. nud.] ex Miquel in Hooker, Lond. Journ. Bot. **7**: 453 (1848)–King in Fl. Brit. Ind. **5**: 534 et in Ann. Bot. Gard. Calcut. **1**: 161, t. 206 (1888).

Yoksam–Bakkim, 1800–2800 m (May 18, 1960); Iladanda–Selap, 1800–2600 m (Nov. 9, 1963, fr.); Ghatte–Khebang, 1600–2400 m (Nov. 19, 1963); Dhara Pani–Illam, 1500–1200 m (Dec. 5, 1963).

Distr. Himalaya (Hazara to Bhutan), Assam, Khasia, Burma, and China.

Ficus religiosa L., Sp. Pl. ed. 1, 1059 (1753)–King in Ann. Bot. Gard. Calcut. **1**: 55, t. 67 A (1887); in Fl. Brit. Ind. **5**: 513 (1888)–Corner, l.c. **17**: 370 (1960).

Tista Bazar, 300 m (Jun. 20, 1960, fl.); Dhankuta, 1200 m, cult. (Oct. 19, 1963, fr.).

Distr. Himalaya and India, but cultivated widely in SE. Asia.

Ficus Rumphii Blume, Bijdr. 437 (1825)–King in Ann. Bot. Gard. Calcut. **1**: 54, t. 67 B. (1887); in Fl. Brit. Ind. **5**: 512 (1888)–Corner, l.c. **17**: 371 (1960).

Illam–Ranga Pani, 1200–400 m (Dec. 8, 1963, fr.).

Distr. Himalaya, India, Burma, Thai, Indo-China, and Malaysia.

Ficus sarmentosa Hamilton ex J. E. Smith in Rees, Cyclop. **14**: no. 45 (1810)–Corner, l.c. **18**: 6 (1960).

F. foveolata Wallich [Cat. no. 4493 (1831), nom. nud.] ex Miquel in Ann. Mus. Bot. Lugd.-Bat. **3**: 294 (1867)–King in Fl. Brit. Ind. **5**: 528 (1888); in Ann. Bot. Gard. Calcut. **1**: 133, t. 166–168 (1888)–Rehder in Journ. Arn. Arb. **10**: 124 (1929)–Kitamura, Faun. & Fl. Nepal Himal. 110 (1955).

Helok–Iladanda, 1500–1800 m (Nov. 8, 1963); Yamphodin–Ghatte, 2100–1600 m (Nov. 16 & 18, 1963, fl.); Ghatte–Khebang, 1600–2400 m (Nov. 19, 1963).

Distr. sp. Himalaya (Chamba to Bhutan), India, Burma, Thai, Indo-China, Malaysia, China, Formosa, Ryukyu, Japan, and S. Korea.

A very polymorphic and widely distributed species including some geographical races. In Japan, a subspecies, subsp. *nipponica*1), occurs in middle and western Honshu, Shikoku, and Kyushu. This subspecies differs morphologically from its mother species in having glabrous leaves with 5–6 lateral veins, and sessile, glabrous receptacles.

Ficus semicordata Hamilton ex J. E. Smith in Rees, Cyclop. **14**: no. 71 (1810)–Corner, l.c. **17**: 449 (1960).

F. Cunia Hamilton ex Roxburgh, Fl. Ind. ed. 2, **3**: 561 (1832)–King in Fl. Brit. Ind. **5**: 523 (1888); in Ann. Bot. Gard. Calcut. **1**: 101, t. 126, 127 (1888).

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1) **Ficus sarmentosa** Hamilton ex J. E. Smith subsp. **nipponica** (Fr. et Sav.) Ohashi, stat. nov.
F. nipponica Franchet et Savatier, Enum. Pl. Jap. **1**: 436 (1875).
F. foveolata var. *nipponica* (Fr. et Sav.) King in Ann. Bot. Gard. Calcut. **1**: 134, t. 167 E (1888).
F. sarmentosa var. *nipponica* (Fr. et Sav.) Corner in Gard. Bull. Singap. **18**: 7 (1960).

Tingling Bridge–Yoksam, 1000–1700 m (May 16, 1960, fr.); Sanguri Bhanjang, 1200 m (Oct. 16, 1963, fl.); Dhankuta, 1200 m (Oct. 19, 1963); Taplethok–Helok, 1400–1500 m (Nov. 6, 1963, fl.); Helok–Iladanda, 1500–1800 m (Nov. 8, 1963, fl.); Sibganja–Mahara Bahara, 200 m (Dec. 12, 1963, fl.).

Distr. Himalaya (Chenab to Bhutan), India, Burma, Indo-China, and China.

Maclura cochinchinensis (Lour.) Corner in Gard. Bull. Singap. **19**: 239 (1962).

Vanieria cochinchinensis Loureiro, Fl. Cochinch. 564 (1790)–Nakai in Bot. Mag. Tokyo **41**: 515 (1927).

Cudrania javensis Trecul in Ann. Sci. Nat. ser. 3, **8**: 123, t. 3, f. 76–85 (1847)–Hook. f., Fl. Brit. Ind. **5**: 538 (1888).

C. cochinchinensis (Lour.) Kudo et Masamune in Ann. Rep. Bot. Gard. Taihoku **2**: 27 (1932)–Backer in Blumea **6**: 302 (1948).

Chovar Gorge, Kathmandu, 1200 m (Sep. 21, 1963, fr.); Dhankuta, 1200 m (Oct. 18 & 19, 1963, fr.).

Distr. sp., Himalaya (Garhwal to N. Assam), India, Ceylon, Burma, Thai Indo-China, Malaysia, China, Formosa, Ryukyu, Japan, and Australia.

In Japan, a more spinous and less pubescent form belonging to this species is native to western Honshu, Shikoku and Kyushu, and it has been distinguished as a variety¹⁾.

Morus australis Poiret in Lamarck, Encycl. Méth. **4**: 380 (1797)–Nakai in Journ. Arn. Arb. **8**: 237 (1927)–Rehder in Journ. Arn. Arb. **10**: 123 (1929)–Hotta, Taxon. Stud. Morus Pl. Jap. 27 (1958).

M. indica (non L. 1753) Roxburgh, Fl. Ind. ed. 2, **3**: 596 (1832)–Hook. f., Fl. Brit. Ind. **5**: 492 (1888).

Peshok, 900 m, cult. (Apr. 27, 1960, fr.); Lopchu, cult. (Apr. 28, 1960, fr.); Rimbick–Ramam, 1900–2400 m, cult. (May 7, 1960); Swayambhu Nath, 1500 m (Sep. 23, 1963); Helok, 1500 m (Nov. 8, 1963); Thakma Khola, 3000 m (Nov. 13, 1963); Ghatte–Khebang, 1600–1700 m (Nov. 19, 1963); Khebang, 1400 m (Nov. 23, 1963); Tharpu–Chyangthaphu, 1200 m (Nov. 26, 1963); Dhara Pani–Illam, 1500–1200 m (Dec. 5, 1963); Gauriganja–Rangali, 200 m (Dec. 13, 1963, fr.).

Distr. Himalaya (Kashmir to Sikkim), India, Burma, Indo-China, China, and Japan.

Morus macroura Miquel, Pl. Jungh. 42 (1851)–Corner in Gard. Bull. Singap. **19**: 215 (1962).

M. laevigata Wallich [Cat. no. 4649 (1831), nom. nud.] ex Brandis, For. Fl. Ind. 409 (1874)–Fl. Brit. Ind. **5**: 492 (1888)–Schneid. in Pl. Wilson. **3**: 301 (1917).

Rabong La–Temi, lower road, 1200 m (Mar. 28, 1963).

Distr. Himalaya, India, Burma, and W. China (Yunnan).

Streblus asper Loureiro, Fl. Cochinch. 615 (1790)–Fl. Brit. Ind. **5**: 489 (1888)–Corner in Gard. Bull. Singap. **19**: 228 (1962).

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1) **Maclura cochinchinensis** (Lour.) Corner var. **gerontogea** (Sieb. et Zucc.) Ohashi, comb. nov.

M. gerontogea Siebold et Zuccarini in Abh. Akad. Wiss. Muench. **4** (3): 220 (1846).

V. cochinchinensis var. *gerontogea* (Sieb. et Zucc.) Nakai in Bot. Mag. Tokyo **41**: 516 (1927).

Cudrania cochinchinensis var. *gerontogea* (Sieb. et Zucc.) Kudo et Masam. in Ann. Rep. Bot. Gard. Taihoku **2**: 27 (1932).

Gauriganja–Rangali, 200 m (Dec. 13, 1963, fr.); Kathgara–Rangali, 200 m (Dec. 14, 1963, fr.).

Distr. Himalaya, India, Burma, Thai, Indo-China, Malaysia, and W. China.

Our specimens are referable to var. *asper* characterized by having four stamens in male flower.

URTICACEAE (by Takasi Tuyama)

Boehmeria Hamiltoniana Weddell in Ann. Sci. Nat. ser. 4, **1**: 199 (1854); Monogr. Urt. 371 (1856)–Hook. f., Fl. Brit. Ind. **5**: 579 (1888)–Hand.-Mzt., Symb. Sin. **7**: 151 (1929).

Ghatte–Khebang, 1600–2400 m (Nov. 19, 1963).

Distr. Tropical Himalaya (Nepal to Bhutan, Mishmi Hills), Khasia, Burma, and W. China (Yunnan).

The axils of the basal leaf-nerve are often 2-glandular as J. D. Hooker stated in his Flora.

Boehmeria macrophylla D. Don, Prodr. Fl. Nepal. 60 (1825)–Wedd., Monogr. Urt. 375, t. 11 (1856)–Fl. Brit. Ind. **5**: 577 (1888)–Hand.-Mzt., Symb. Sin. **7**: 151 (1929).

Phusri–Dhara Pani (Oct. 16, 1963); Tuwa–Taplethok, 1800–1400 m (Nov. 5, 1963); Khebang–Bharomdin, 1700–1000 m (Nov. 24, 1963); Bharomdin–Tharpu, 1000–700 m (Nov. 25, 1963); Illam–Ranga Pani, 1200–400 m (Dec. 8, 1963); Ranga Pani–Ghorwa, 700–300 m (Dec. 9, 1963); Ghorwa–Sanichare, 300–200 m (Dec. 10, 1963).

Distr. Subtropical Himalaya (Kumaon to Mishmi Hills), Khasia, Burma, Laos, Tonkin and W. China (Szechuan, Yunnan).

Copious along the river sides. The branchlets are pendulous with heavy infructescences. This agrees well with Wallich's specimen (Cat. 4595 *Urtica penduliflora*) at Kew.

Boehmeria platyphylla D. Don, Prodr. Fl. Nepal. 60 (1825)–Wedd., Monogr. Urt. 364 (1856)–Fl. Brit. Ind. **5**: 578 (1888)–Satake in Faun. & Fl. Nepal Himal. 110 (1955). [Pl. 18 c]

Phusri–Dhara Pani (Oct. 16, 1963); Dhara Pani–Dhankuta (Oct. 17, 1963); Tharpu–Chyangthapu, 1200–1300 m (Nov. 26, 1963); Illam–Ranga Pani, 1200–400 m (Dec. 8, 1963); Ranga Pani–Ghorwa, 700–300 m (Dec. 9, 1963).

Distr. (incl. varr.) Tropical and subtropical Himalaya (Simla to E. Nepal), India, Ceylon, Burma, Thai, Indo-China, and W. China (Yunnan, Kweichow).

Only the specimens with broad subcordate leaves that is identical with Wallich's original one (4582 *Urtica macrostachya* Wall.) are quoted here. We have collected many other specimens which have equally few-branching and suberect stems with pendulous infructescences and thick scabrid leaves, but are different in having narrower, ovate-elliptic leaf-blades with the rounded base. This species including the varieties is not distributed to Japan or E. China.

Boehmeria polystachya Weddell in Ann. Sci. Nat. ser. 4, **1**: 200 (1854); Monogr. Urt. 370 (1856)–Clarke in Journ. Linn. Soc. **15**: 125 (1876)–Fl. Brit. Ind. **5**: 579 (1888).

Sinduwa, 2100 m (Oct. 24, 1963); Bilbatay Bhanjang–Hati Sar, 2400–2900 m (Oct. 27, 1963); Thakma Khola–Yamphodin, 3500–2100 m (Nov. 17, 1963); Siling Tzokupa

(Nov. 21, 1963).

Distr. Temperate Himalaya (Kumaon to Mishmi Hills), Khasia, and W. China (Yunnan).

This is identical with the type specimen (*Urtica polystachya* Wall., Cat. no. 4584) from Nepal.

Boehmeria rugulosa Weddell in Ann. Sci. Nat. ser. 4, **1**: 200 (1854), Monogr. Urt. 373 (1856)-Fl. Brit. Ind. **5**: 577 (1888).

Garhi Danra-Tuwa, 2200-1800 m (Nov. 4, 1963); Taplethok-Helok, 1400-1500 m (Nov. 6, 1963); Helok, 1500 m (Nov. 7, 1963); Khebang-Bharomdin, 1700-1000 m (Nov. 24, 1963).

Distr. Subtropical Himalaya (Garhwal to Bhutan).

An arborescent species with coriaceous elliptic leaves whitish beneath.

Boehmeria sidaefolia Weddell in Ann. Sci. Nat. ser. 4, **1**: 203 (1854); Monogr. Urt. 356 (1856)-Fl. Brit. Ind. **5**: 576 (1888).

Taplejung-Garhi Danra, 1900-2200 m (Nov. 3, 1963).

Distr. Subtropical Himalaya (E. Nepal to Mishmi Hills), Khasia, Burma, and Tonkin.

A diffusely branching plant with rather thin leaves.

Boehmeria ternifolia D. Don, Prodr. Fl. Nepal. 59 (1825).

Boehmeria platyphylla D. Don var. *cuspidata* Wedd. subvar. *canescens* Wedd., Monogr. Urt. 365 (1856).

Boehmeria platyphylla D. Don var. *canescens* Wedd. in DC., Prodr. **16** (1): 213 (1869)-Fl. Brit. Ind. **5**: 579 (1888).

Takdah, 1700 m (Apr. 19, 1960, no. 2147); Mani Bhanjang-Batasi (May 1, 1960); Rimbick-Ramam, 1900-2400 m (May 7, 1960, no. 145); Gangtok (Jun. 17, 1960); Taplejung, 1700 m (Nov. 2, 1963); Taplejung-Garhi Danra (Nov. 3, 1963); Garhi Danra-Tuwa, 2200-1800 m (Nov. 4, 1963); Taplethok-Helok, 1400-1500 m (Nov. 6, 1963); Siling Tzokupa-Khebang, 2100-1700 m (Nov. 22, 1963); Yekting-Batasay, 1400-2400 m (Nov. 30, 1963); Mai Majuwa-Dhara Pani, 1500-1900 m (Dec. 4, 1963).

Distr. Subtropical Himalaya (Kumaon to E. Nepal).

Densely villose-hirsute, and the leaves gross-serrate. The leaf shape reminds us that of Japanese *Boehmeria platanifolia* Fr. et Sav.

Chamabainia cuspidata Wight, Icon. t. 1981 (1853)-Wedd., Monogr. Urt. 387, t. 12 (1856)—Fl. Brit. Ind. **5**: 580 (1888)-Satake in Faun. & Fl. Nepal Himal. 111 (1955)-Backer, Fl. Jav. **2**: 46 (1965).

Birch Hill, Darjeeling, 2000 m (Jun. 18, 1960); Bilbatay Bhanjang-Hati Sar, 2200-2900 m (Oct. 27, 1963).

Distr. Tropical Himalaya (Garhwal to Sikkim), Khasia, Nilghiris, Ceylon, Tonkin, W. China (Yunnan, Szechuan, Kweichow), and Formosa.

Debregeasia longifolia (Burm. f.) Weddell in DC., Prodr. **16** (1): 235[24] (1869)-Schneider in Pl. Wilson. **3**: 313 (1916)-Satake in Faun. & Fl. Nepal Himal. 111 (1955).

Urtica longifolia Burm. f., Fl. Ind. 197 (sphalmate 297) (1768).

Debregeasia velutina Gaudich., Bot. Bonite Voy. t. 90 (1842-43)-Wedd., Monogr. Urt. 460, t. 15 A (1856)-Fl. Brit. Ind. **5**: 590 (1888).

Rimbick-Ramam, 1900-2400 m (May 7, 1960); Yoksam-Bakkim, 1700-2200 m

(May 18, 1960).

Distr. Subtropical Himalaya (Kumaon to Sikkim), Khasia, Nilghiris, S. India, Ceylon, Burma, Laos, Tonkin, Annam, China (Yunnan, Hupeh), Malaya, and Java.

The Himalayan plant has coarser serration and longer spreading hairs on the branch and petiole compared with those of Japanese *D. edulis* Wedd. According to Sargent, Yunnan and Hupeh specimens are intermediate between the two. Hunan specimen of University of Tokyo accords well with the Japanese form.

Elatostema Hookerianum Weddell, Monogr. Urt. 309 (1856)–Fl. Brit. Ind. **5**: 567 (1888)–Schröter in Fedde, Rep. Beih. **83** (1): 30 (1935).

Birch Hill, Darjeeling, 2000 m (Apr. 1 & 5, 1960; May, 16 & 25, 1963); Batasi, 2000 m (May 3, 1960); Batasi–Palmajua, 2300–2600 m (May 3, 1960); Penlong La, 2100 m (May 18, 1963); Darjeeling, at the entrance of Lloyd Bot. Gard. (May 25, 1963).

Distr. Sikkim, Khasia, and Naga Hills.

Elatostema lineolatum Wight, Icon. t. 1984 (1853)–Fl. Brit. Ind. **5**: 565 (1888)–Schröter in Fedde, Rep. Beih. **83** (1): 30 (1935).

Middle camp, Singtam–Gangtok, 700 m (Mar. 29, 1963).

Distr. Tropical Himalaya (Kumaon to Bhutan), Khasia, Ceylon, and Burma.

The stem is pubescent, the leaves are glabrous on both surfaces and the cystoliths are very prominent on the upper surface in the Himalayan specimens. Our Formosan var. *major* is not like this, and may belong to a different species.

Elatostema obtusum Weddell in Ann. Sci. Nat. ser. 4, **1**: 190 (1854); Monogr. Urt. 324 (1856)–Fl. Brit. Ind. **5**: 573 (1888)–Schröter in Fedde, Rep. Beih. **83** (1): 30 (1935).

Bakkim–Jongri, 2800–4000 m (May 19, 1960); Garibans–Tonglu, 2800–3000 m (Jun. 7, 1960); Tendong Peak, 2750 m (Mar. 26, 1963); Bilbatay Bhanjang, 2200 m (Oct. 25, 1963); Bilbatay Bhanjang–Hati Sar (Oct. 27, 1963); Minchin Dhap–Mul Pokhari, 2900–2500 m (Oct. 29, 1963); above Lelep (Nov. 9, 1963); Selap–Walunchung Gola, 2600–3800 m (Nov. 10, 1963); Baroya Khimty, 2500 m (Nov. 11, 1963); Baroya Khimty–Thakma Khola, 2500–3200 m (Nov. 12, 1963); Diorali Bhanjang, 3500 m (Nov. 14, 1963); Bhuspate Danra, 2600 m (Dec. 2, 1963).

Distr. Temperate Himalaya (Kumaon to Bhutan), Khasia, and W. China (Yunnan).

Abundant, ascending to the highest altitude among the Urticaceae we have collected. Creeping on rocks or mosses.

Elatostema platyphyllum Weddell, Monogr. Urt. 301 (1856)–Fl. Brit. Ind. **5**: 566 (1888)–Schröter in Fedde, Rep. Beih. **83** (1): 30 (1935).

Rayang, 250 m (Apr. 21, 1960, no. 1823); Tingling Bridge, 1000 m (May 16, 1960, no. 317); Rabong La–Temi, Lower Road, 1200 m (Mar. 28, 1963); Tuwa–Taplethok, 1800–1400 m (Nov. 5, 1963); Illam–Ranga Pani, 1200–400 m (Dec. 8, 1963).

Distr. Tropical Himalaya (Kumaon to Sikkim), Khasia, Naga Hills, and Formosa.

These well coincide with Khasia and Kumaon plants collected by Hooker et Thomson, and Thomson at Kew. The large leaf and its strongly auriculated base are characteristic to this species. There are two forms; glabrous and pubescent.

Elatostema reptans Hooker f., Fl. Brit. Ind. **5**: 567 (1888)-Schröter in Fedde, Rep. Beih. **83** (1): 30 (1935). [Pl. 18 a, b]

Tista Bridge, 300 m (Jun. 19, 1960).

Distr. E. Himalaya (Sikkim), and Burma (Chittagon).

A rather rare plant. Only a female specimen was collected, and it agrees well with the type specimen of Griffith at Kew.

Elatostema sessile Forster, Char. Gen. 106 (1776)-Wedd., Monogr. Urt. 294, t. 9 (1856)-Fl. Brit. Ind. **5**: 563 (1888)-Schröter in Fedde, Rep. Beih. **83** (1): 30 (1935)-Satake in Faun. & Fl. Nepal Himal. 111 (1955).

Bilbatay Bhanjang, 2200 m (Oct. 26, 1963); Zongi-Iladanda, 2800-1800 m (Nov. 12, 1963); Thakma Khola-Yamphodin (Nov. 17, 1963).

Distr. (incl. varr.) Temperate and subtropical Himalaya (Chamba of Himachal Pradesh to Sikkim), Khasia, Naga Hills, Nilghiris, Ceylon, Burma, Malaya, W. China (Yunnan, Kweichow, Hunan), and Formosa.

Elatostema surculosum Wight, Icon. t. 2091, f. 4 (1853)-Wedd., Monogr. Urt. 329 (1856)-Fl. Brit. Ind. **5**: 572 (1888)-Schröter in Fedde, Rep. Beih. **83** (1): 30 (1935)-Satake in Faun. & Fl. Nepal Himal. 111 (1955).

Yoksam, 1750 m (May 17, 1960); Preig Chu-Jongri, 2300-4000 m (May 19, 1960); Garibans-Tonglu, 2800-3000 m (Jun. 7, 1960); Sandakphu-Garibans, 3000 m (Jun. 7, 1960); Gangtok, 1600 m (Jun. 15, 1960); Senchal-Tiger Hill, 2400-2500 m (Jun. 23, 1960); Bilbatay Bhanjang-Hati Sar, 2200-2700 m (Oct. 27, 1963); Hati Sar-Minchin Dhap, 2700-2900 m (Oct. 28, 1963); Minchin Dhap-Mul Pokhari, 2900-2500 m (Oct. 29, 1963); Baroya Khimty-Thakma Khola, 2500-3200 m (Nov. 12, 1963); Diorali Bhanjang (Nov. 14, 1963).

Distr. Temperate Himalaya (Simla to Sikkim), Khasia, Naga Hills, Nilghiris, Ceylon, Indo-China, and W. China (Yunnan, Szechuan).

An exceedingly variable species. I could not separate these specimens into distinct varieties.

Girardinia palmata (Forsk.) Gaudichaud in Freyc. Voy. Bot. 498 (1830)-Hand.-Mzt., Symb. Sin. **7**: 119 (1929)-Backer, Fl. Jav. **2**: 39 (1965).

Urtica palmata Forsk., Fl. Aegypt.-Arab. 159 (1775).

Girardinia heterophylla Decne. in Jacquem., Voy. Bot. **4**: 151, t. 153 (1844)-Wedd., Monogr. Urt. 164 (1856)-Fl. Brit. Ind. **5**: 550 (1888)-Gagnep., Fl. Gén. Indo-Chin. **5**: 854 (1929).

Urtica heterophylla Vahl, Symb. **1**: 76 (1790).

Darjeeling, 2200 m (Jun. 24, 1960); Dhara Pani, 900-1200 m (Oct. 16, 1963).

Distr. Temperate and subtropical Himalaya (Nepal, Sikkim), Assam, Burma, Ceylon, Thai, Laos, S. & C. China (Szechuan, Yunnan, Hupeh), and Java.

Gonostegia hirta (Bl.) Miquel, Ann. Mus. Bot. Lugd.-Bat. **4**: 303 (1869)-Backer, Fl. Jav. **2**: 48 (1965).

Urtica hirta Blume, Bijdr. 495 (1825).

Pouzolzia hirta (Bl.) Hassk., Cat. Hort. Bogor. 80 (1844)-Fl. Brit. Ind. **5**: 586 (1888).

Gangtok, 1600 m (Apr. 26, 1960 & Jun. 14 et 16, 1960); Palmajua-Rimbick, 1500-2200 m (May 5, 1960); Dentam-Pamianchi, 1500-2000 m (May 12, 1960); Tingling Bridge-Yoksam, 1100-1700 m (May 16, 1960).

Distr. Tropical Himalaya (Chamba to Sikkim), Assam, S. India, Burma, Thai, Indo-China, S. China (incl. Formosa), Japan, Malaysia, and Australia.

Laportea terminalis Wight, Icon. t. 1972 (1853)–Wedd., Monogr. Urt. 125, 2 C (1856)–Fl. Brit. Ind. **5**: 549 (1888)–Backer, Fl. Jav. **2**: 38 (1965).

Lagyap, Gangtok, 2200 m (Sep. 13, 1964).

Distr. Subtropical Himalaya (Kumaon to Mishmi Hills), Nilghiris, Ceylon, W. China (Yunnan, Szechuan, Hunan), and Java.

Stinging hairs copious, non bulbiferous.

Lecanthus peduncularis (Royle) Weddell in DC., Prodr. **16** (1): 164 (1869)–Backer, Fl. Jav. **2**: 41 (1965).

Procris peduncularis Royle, Ill. Bot. Himal. t. 83 (1836), cum fig. analytic.–Hand.-Mzt., Symb. Sin. **7**: 142 (1929).

Procris obtusa Royle, l. c. t. 83, fig. c (1836), cum fig. analytic.

Lecanthus Wightii Wedd. in Ann. Sci. Nat. ser. 4, **1**: 187 (1854)–Fl. Brit. Ind. **5**: 559 (1888).

Lecanthus obtusus (Royle) Hand.-Mzt., Symb. Sin. **7**: 143 (1929).

Gangtok, 1600 m (Jun. 15 et 16, 1960); Darjeeling (Jun. 24, 1960); Gokarna Forest near Kathmandu, 1500 m (Sept. 22, 1963); Phusri–Dhara Pani (Oct. 16, 1963); Murhay–Bilbatay Bhanjang (Oct. 24, 1963); Bilbatay Bhanjang, 2200 m (Oct. 26, 1963); Taplejung, 7100 m (Nov. 2, 1963); Taplejung–Garhi Danra, 1900–2200 m (Nov. 3, 1963); Siling Tzokupa–Khebang, 2100–1700 m (Nov. 22, 1963); Mai Majuwa–Dhara Pani, 1500–1900 m (Dec. 4, 1963); Penlong La, 2100 m (Sept. 13, 1964).

Distr. Temperate Himalaya (Chamba to Sikkim), Khasia, Naga Hills, S. India, Ceylon, Burma, Indo-China, W. & C. China (Yunnan, Kwangtung, Hunan), Formosa, Java and tropical Africa.

A very variable plant. *Procris obtusa* is undoubtedly a depauperated form.

Maoutia Puya (Hook. f.) Weddell in Ann. Sci. Nat. ser. 4, **1**: 193 (1854), Monogr. Urt. 447, t. 16 B (1857)–Fl. Brit. Ind. **5**: 592 (1888)–Hand.-Mzt., Symb. Sin. **7**: 154 (1929)–Backer, Fl. Jav. **2**: 50 (1965).

Boehmeria Puya Hook. f. in Lond. Journ. Bot. **3**: 316, t. 7 (1851).

Tharpu–Chyangthapu, 1200–1300 m (Nov. 26, 1963).

Distr. Tropical Himalaya (Garhwal to E. Nepal), Khasia, Burma, Indo-China, and S. W. China (Yunnan, Szechuan, Kweichow).

Rare in the regions explored.

Pellionia heteroloba Weddell, Monogr. Urt. 283, t. 5 (1856); in DC., Prodr. **16** (1): 166 (1869)–Fl. Brit. Ind. **5**: 559 (1888).

Mani Bhanjang–Batasi, 2000–2100 m (May 1, 1960); Yoksam–Bakkim, 1700–2200 m (May, 18, 1960).

Distr. E. Himalaya (Sikkim), Khasia, and ?Tonkin.

Pilea anisophylla Weddell, Monogr. Urt. 193 (1856)–Fl. Brit. Ind. **5**: 552 (1888).

Happy Valley, Darjeeling, 2000 m (Jun. 26, 1960); Taplejung–Garhi Danra, 1900–2200 m (Nov. 3, 1963); above Lelep, 1500 m (Nov. 8, 1963); Ghatte–Khebang (Nov. 19, 1963); Khebang–Siling Tzokupa, 1700–2100 m (Nov. 24, 1963); Khebang–Bharomdin, 1700–1000 m (Nov. 24, 1963); Mai Majuwa–Dhara Pani, 1500–1900 m (Dec. 4, 1963).

Distr. Subtropical Himalaya (Nepal to Bhutan), Naga Hills, Yunnan, and Formosa.

Pilea approximata C. B. Clarke in Journ. Linn. Soc. **15**: 123 (1876)–Fl. Brit. Ind. **5**: 553 (1888)–Satake in Faun. & Fl. Nepal Himal. 112 (1955).

Nayathang–Chia Bhanjang, 3500–3100m (Jun. 2, 1960); Chia Bhanjang, 3100 m (Jun. 2, 1960); Chia Bhanjang–Phalut, 3100–3500 m (Jun. 3, 1960); Senchal–Tiger Hill, 2400–2500 m (Jun. 23, 1960).

Distr. E. Himalaya (Nepal, Sikkim).

This seems strictly endemic to the southern part of Sikkim. It grows in small group on the mossy bark of trees.

Pilea cordifolia Hooker f., Fl. Brit. Ind. **5**: 558 (1888).

Darjeeling, 2100 m (Jun. 21,1960).

Distr. Temperate Himalaya (Sikkim), and Khasia.

This is rare. The specimen cited above has a very young inflorescence but agrees quite well with the type specimen at Kew collected by C. B. Clarke in the same place as above.

Pilea Hookeriana Weddell, Monogr. Urt. 226 (1856)–Fl. Brit. Ind. **5**: 557 (1888)–Forbes et Hemsley in Journ. Linn. Soc. **26**: 476 (1899).

Sanguri Bhanjang, 1200 m (Oct. 16, 1963).

Distr. Sikkim, Khasia, ?Naga Hills, Tonkin, and ?W. China (Yunnan).

The male plants with moniliformly arranged inflorescences are identical with the type specimen collected by J. D. Hooker in Sikkim. Kohima specimen collected by C. B. Clarke and determined by Hooker and Handel-Mazzetti as *Pilea Hookeriana* and the specimen quoted by the latter author from Yunnan seems to belong to a quite different species, as they have manifestly serrate and smaller leaves with smaller inflorescences.

Pilea racemosa (Royle) Tuyama, comb. nov.

Procris recemosa Royle, Ill. Bot. Himal. t. 83 (1836), cum fig. analytic.

Pilea Wightii Wedd. var. ? *Roylei* Hook. f., Fl. Brit. Ind. **5**: 555 (1888).

Pilea thalictrifolia C. B. Clarke, mss. in Kew Herb.

Phalut, 3500 m, among the scattered grass (Jun. 5, 1960).

Distr. E. Himalaya (Sikkim).

Handel-Mazzetti's *Pilea subalpina* is different from this one by having obscurely crenate and broadly elliptic or obovate-elliptic leaves.

Pilea scripta (Ham.) Weddell, Monogr. Urt. 222 (1856)–Fl. Brit. Ind. **5**: 556 (1888)–Hand.-Mzt., Symb. Sin. **7**: 122 et 132 (1929).

Urtica scripta Hamilt. ex D. Don, Prodr. Fl. Nepal. 59 (1825).

Darjeeling, 2100 m (Jun. 19, 1960); Ghum–Lopchu, 2300–1500 m (Jun. 19, 1960); Phusri–Dhara Pani, 800–1200 m (Oct. 16, 1963); Godavari Forest, Kathmandu, 1500 m (Sep. 18, 1963).

Distr. Temperate Himalaya (Nepal to Mishmi Hills), Khasia, Burma, and W. China (Yunnan).

Pilea smilacifolia Weddell in Ann. Sci. Nat. ser. 4, **1**: 186 (1854); Monogr. Urt. 181 (1856)–Fl. Brit. Ind. **5**: 553 (1888)–Ward in Brittonia **4** (1): 46 (1941).

Takdah–Rayang, 1600–200 m (Apr. 20, 1960).

Distr. Tropical Himalaya (Sikkim to Mishmi Hills), Khasia, Burma, and ?Java.

A rather rare plant in Sikkim. Much branching suffrutex.

Pilea Symmeria Weddell, Monogr. Urt. 246 (1856)–Fl. Brit. Ind. **5**: 554 (1888)–Hand.-Mzt., Symb. Sin. **7**: 122 et 133 (1929).

Chia Bhanjang, 3100 m (Jun. 2, 1906, no. 731); Chia Bhanjang–Phalut (Jun. 2, 1960); Phalut, 3500 m (Jun. 3, 1960, no. 642); Sandakphu–Garibans, 3600–2800 m (Jun. 7, 1960); Ghum–Kurseong, 2300–1500 m (Jun. 22, 1960); Senchal–Tiger Hill, 2400–2500 m (Jun. 23, 1960); Bilbatay Bhanjang–Hati Sar, 2200–2900 m (Oct. 27, 1963, fr.).

Distr. Temperate Himalaya (Kumaon to Sikkim), Khasia, and W. & S. China (Yunnan, Szechuan, Kweichow, Hupeh, Fukien, Hongkong).

The leaves tend to be coarsely serrulate and ovate, often minutely sinuated at the base. *Pilea scripta* has elliptic leaves minutely and also depressedly serrulate. The achenes of this plant are much larger than those of *Pilea scripta.*

Pilea ternifolia Weddell, Monogr. Urt. 202 (1856)–Fl. Brit. Ind. **5**: 552 (1888).

Batasi, 2000 m (May, 2, 1960); Garibans–Tonglu, 2800–3000 m (Jun. 7, 1960); Gatribas, 2800 m, on trees (Sep. 16, 1964); Senchal, 2400 m, on mossy trunk (Sep. 19, 1964).

Distr. Temperate Himalaya (Sikkim). Endemic.

Pilea umbrosa Weddell in Ann. Sci. Nat. ser. 4, **1**: 187 (1854); Monogr. Urt. 243 (1856)–Fl. Brit. Ind. **5**: 556 (1888)–Hand.-Mzt., Symb. Sin. **7**: 121 et 130 (1929).

Senchal, 2400 m (Apr. 16, 1960, no. 1948); Birch Hill, Darjeeling, 2000 m (Jun. 18, 1960); Rimbick, 2200 m (May 6, 1960, no. 107); Gangtok, 1600 m (Jun. 15, 1960).

Distr. Temperate Himalaya (Kashmir to Sikkim), Khasia, and W. China (Yunnan, Szechuan).

A densely villose species of robust growth.

Pouzolzia zeylanica (L.) J. Bennett et Brown, Pl. Jav. Rar. 67 (1838)–Merrill, in Trans. Amer. Philos. Soc. n. s. **24** (2) : 140 (1935).

Parietaria zeylanica L., Sp. Pl. ed. 1, 1052 (1753).

Parietaria indica L., Mant. Pl. **1**: 128 (1767).

Pouzolzia indica (L.) Gaudich., Freyc. Voy. Bot. 503 (1830)–Fl. Brit. Ind. **5**: 581 (1888).

Rayang, 200 m (Apr. 23, 1960); Tista Bazar, 300 m (Apr. 26, 1960); Rangpo–Tista Bazar, 350-300 m (Jun. 18, 1960); Sunderijal Waterfall, near Kathmandu, 1600 m (Sep. 20, 1963); Chobar Gorge (Sep. 21, 1963); Kathmandu Airport, 1400 m (Oct. 13, 1963); Biratnagar, 200 m (Oct. 13, 1963).

Distr. Throughout the tropical and subtropical India, Ceylon, Burma, Thai, Indo-China, Malaysia, north to China and S. Japan.

Urtica parviflora Roxburgh, Fl. Ind. ed. 2, **3**: 581 (1832)–Wedd., Monogr. Urt. 85 (1856)–Wight, Icon. t. 690 (1843)–Fl. Brit. Ind. **5**: 548 (1888)–Forbes et Hemsley in Journ. Linn. Soc. **26**: 472 (1899)–Satake in Faun. & Fl. Nepal Himal. 113 (1955).

Rimbick–Ramam, 1900–2400 m (May 7, 1960); Darjeeling, 2100 m (Jun. 27, 1960).

Distr. Temperate Himalaya (Kashmir to Mishmi Hills), Nilghiris and W. China (Yunnan).

In our collection of the genus *Urtica*, there are two other species that could not be determined as yet.

Villebrunea frutescens (Thunb.) Blume, Mus. Bot. Lugd.-Bat. **2**: 168

(1856)-Fl. Brit. Ind. **5**: 590 (1888).

Urtica frutescens Thunb., Fl. Jap. 70 (1784).

Takdah-Rayang, 1600-200 m (Apr. 20, 1960); Tista Bazar (Apr. 26 & Jun. 20, 1960); Tingling Bridge-Yoksam, 1000-1700 m (May 16, 1960); Gangtok-Rangpo (Jun. 18, 1960); Rhenok, down in the valley, 1000 m (May 19, 1963).

Distr. Tropical and subtropical Himalaya (Kumaon to Sikkim), Khasia, Indo-China, W. and S. China (Yunnan, Hupeh, Hainan, Hongkong), and S. Japan (incl. Ryukyu).

PROTEACEAE (by Hiroo Kanai)

Helicia nilagirica Bedd. in Madr. Journ. Lit. Sci. ser. 3, **1**: 56, pl. 11 (1864)-Fl. Brit. Ind. **5**: 190 (1886)-Sleumer in Blumea **8**: 69 (1955).

H. erratica Hook. f. in Fl. Brit. Ind. **5**: 189 (1886).

Gangtok-Saramsa Medicinal Garden, 1500 m (Jun. 17, 1960, fl.).

Distr. E. Himalaya (Sikkim, Bhutan), India (southern and eastern parts), Burma, Thai, Indo-China, and W. China (Yunnan).

SANTALACEAE (by Hiroo Kanai)

Henslowia granulata Hook. f. et Thoms. ex DC., Prodr. **14**: 632 (1857)-Fl. Brit. Ind. **5**: 232 (1886)-Brandis, Ind. Trees 554 (1906).

Tendong-Damthang, 2300 m (Mar. 26, 1963); Iladanda-Selap, 2300 m (Nov. 9, 1963, bud); Baroya Khimty, 2500 m (Nov. 10, 1963, bud); Ghatte-Khebang, 2000 m (Nov. 19, 1963, bud); Birwa, 2000 m (Nov. 27, 1963, bud).

Distr. E. Himalaya (Nepal to Bhutan), and Khasia.

Henslowia heterantha (Wall.) DC., Prodr. **14**: 632 (1857), excl. syn. *H. frutescens*-Fl. Brit. Ind. **5**: 233 (1886)-Brandis, Ind. Trees 554 (1906).

Viscum heteranthum Wall. [Cat. no. 488 (1828), nom. nud.] ex DC., Prodr. **4**: 297 (1830).

Gangtok, 1700 m (Jun. 15, 1960)

Distr. Himalaya (Kumaon to Sikkim), Assam, Manipur, and Burma.

Osyris Wightiana Wall. [Cat. no. 4036 (1831), nom. nud.] ex Wight, Icon. t. 1853 (1852)-Santapau in Rec. Bot. Surv. Ind. ed. 2, **16**: 213 (1960).

Osyris arborea Wall. [Cat. no. 4035 (1831), nom nud.] ex DC., Prodr. **14**: 633 (1857)-Fl. Brit. Ind. **5**: 232 (1886)-Fl. Gén. Ind.-Chin. **5**: 215 (1929).

Sunderijal, Kathmandu, 1600 m (Sep. 20, 1963, fr.); Kakani, Kathmandu, 2100-2200 m (Sep. 24, 1963, fr.); Yektin, 1100 m (Nov. 29, 1963, fl.).

Distr. Himalaya (Simla to Bhutan), India, Ceylon, Burma, Indo-China, and China (Yunnan).

Pyrularia edulis (Wall.) DC., Prodr. **14**: 628 (1857)-Fl. Brit. Ind. **5**: 230 (1886)-Brandis, Ind. Trees 554 (1906).

Sphaerocarya edulis Wall. [Cat. no. 4033 (1929), nom. nud.] in Roxb., Fl. Ind. ed. Carey, **2**: 371 (1824).

Iladanda-Helok, 1800 m (Nov. 13, 1963, fr.).

Distr. E. Himalaya (Nepal, Sikkim), Assam, and Burma.

LORANTHACEAE (by Hiroo Kanai)

Dendrophthoe falcata (L. f.) Etting. in Denkschr. Akad. Wiss. Math.-Nat. Cl. **32**: 52 & 58 (1872).

Loranthus falcatus L. f., Suppl. Pl. 211 (1781).

L. longiflorus Desr. in Lamarck, Encycl. Méth. **3**: 598 (1789)–Fl. Brit. Ind. **5**: 214 (1886).

Illam–Jog Mai, 500 m (Dec. 8, 1963, fl.); Ghorwa–Sanichare, 250 m (Dec. 10, 1963, fl.); Sibganja–Mahara Bahara, 200 m (Dec. 12, 1963, fl.); Kathgara–Rangali, 200 m (Dec. 14, 1963, fl.).

Distr. E. Himalaya (Nepal, and Bhutan), India, and Ceylon.

Dendrophthoe pentandra (L.) Miquel, Fl. Ind. Bat. **1**: 818 (1856)–Danser in Bull. Jard. Bot. Buitenz. ser. 3, **10**: 310 (1929).

Loranthus pentandrus L., Mant. Pl. 63 (1767)–Fl. Brit. Ind. **5**: 216 (1886)–Fl. Gén. Ind.-Chin. **5**: 200 (1929).

Tharpu, 1200 m (Nov. 26, 1963, fl.).

Distr. Nepal, Khasia, Burma, and Malaysia.

Loranthus odoratus Wall. in Roxb., Fl. Ind. ed. Carey, **2**: 215 (1824)–Fl. Brit. Ind. **5**: 204 (1886).

Hyphear odoratum (Wall.) Danser in Bull. Jard. Bot. Buitenz. ser. 3, **10**: 319 (1929).

Rimbick, 2200 m (May 7, 1960, fl.); above Helok, 1600 m (Nov. 8, 1963, fl.); Iladanda–Helok, 1700 m (Nov. 13, 1963, fl.).

Distr. Himalaya (Nepal, Sikkim), Assam, Manipur, and Burma.

Macrosolen cochinchinensis (Lour.) V. Tiegh. in Bull. Soc. Bot. France. **41**: 122 (1895)–Danser in Blumea **2**: 42 (1936).

Loranthus cochinchinensis Lour., Fl. Cochinch. **1**: 195 (1790).

L. globosus Roxb., Fl. Ind. ed. Carey, **2**: 206 (1824)–Fl. Brit. Ind. **5**: 220 (1886).

Elytranthe cochinchinensis (Lour.) G. Don, Gen. Syst. **3**: 426 (1834)–Merrill in Trans. Amer. Philos. Soc. n.s. **24** (2): 141 (1935).

Garhi Danra–Linkhim, 1500 m (Nov. 4, 1963, fr.); Taplethok–Helok, 1500 m (Nov. 6, 1963); Helok, 1700 m (Nov. 8, 1963, fr.).

Distr. E. Himalaya (Nepal, Sikkim), Assam, Burma, China, and Malaysia.

Scurrula elata (Edgew.) Danser in Bull. Jard. Bot. Buitenz. ser. 3, **10**: 350 (1929).

Loranthus elatus Edgew. in Trans. Linn. Soc. **20**: 58 (1846)–Fl. Brit. Ind. **5**: 212 (1886).

Batasi–Palmajua, 2400 m (May 3, 1960, fl.); Rimbick, 2200 m (May 7, 1960, fl.); Hati Sar–Mangalbare, 2600 m (Oct. 28, 1963, fr.); Minchin Dhap–Mul Pokhari, 2700 m (Oct. 29, 1963, fr.).

Distr. Himalaya (Simla to Bhutan), and W. China (Yunnan).

Scurrula parasitica L., Sp. Pl. ed. 1, 110 (1753)–H.-L. Li, Wood. Fl. Taiwan 146 (1963).

Loranthus Scurrula L., Sp. Pl. ed. 2, **1**: 472 (1762)–Fl. Brit. Ind. **5**: 208 (1886)–Fl. Gén. Ind.-Chin. **5**: 195 (1929).

Dentam, 1400 m (May 11, 1960, fl.); Yoksam, 1700 m (May 17, 1960); Rabong La–

Kyosing, 2000 m (Mar. 28, 1963); Mul Pokhari–Gorzu Kosir, 2200 m (Oct. 30, 1963, fl.); Taplethok–Helok, 1500 m (Nov. 6, 1963, fr.); Iladanda–Helok, 1800 m (Nov. 13, 1963, fr.); Ghatte–Khebang, 2000 m (Nov. 19, 1963, fr.); Mai Majuwa–Mai Pokhari, 1800 m (Dec. 4, 1963, fr.).

Distr. Himalaya, India, Burma, Indo-China, Malaya, China (Yunnan, Szechuan, and Kwangtung), and Formosa.

Scurrula pulverulenta (Wall.) G. Don, Gen. Hist. **3**: 421 (1834)–Danser, l.c. 353 (1929).

Loranthus pulverulentus Wall. in Roxb., Fl. Ind. ed. Carey, **2**: 221 (1824)–Fl. Brit. Ind. **5**: 211 (1886).

Phusri, 450 m (Oct. 16, 1963, fl.); Dhara Pani–Tamur Bridge, 600 m (Oct. 17, 1963, fl.); Dumhan–Taplejung, 1400 m (Nov. 1, 1963, y. fr.); Sanichare–Sibganja, 200 m (Dec. 11, 1963, fl.).

Distr. Himalaya (Garhwal to Bhutan), Assam, Manipur, and Burma.

Scurrula umbellifer (Schult.) G. Don, Gen. Hist. **3**: 421 (1834)–Danser, l.c. 353 (1929).

Loranthus umbellatus (non Roth 1821) Wall. in Roxb., Fl. Ind. ed. Carey, **2**: 222 (1824).

L. umbellifer Schult., Syst. Veg. **7** (1): 97 (1829)–Fl. Brit. Ind. **5**: 211 (1886).

Simkuna Bazar–Lopchu, 1500 m (Jun. 20, 1960, fl.); Iladanda–Helok, 1700 m (Nov. 13, 1963, fl.); Ghatte–Khebang, 2100 m (Nov. 19, 1963, fl.).

Distr. E. Himalaya (Nepal, Bhutan), and Assam.

Viscum articulatum Burm. f., Fl. Ind. 311 (1768)–Fl. Brit. Ind. **5**: 226 (1886).

var. **liquidambaricolum** (Hayata) Seshagiri Rao in Journ. Ind. Bot. Soc. **36**: 133 (1957).

V. liquidambaricolum Hayata, Icon. Pl. Formos. **5**: 104 (1915)–Danser in Blumea **4**: 289 (1941).

Batasi, 200 m (May 2, 1960, fr.); Rimbick, 2200 m (May 7, 1960, fr.); Taplethok–Helok, 1500 m (Nov. 16, 1963, fr.).

Distr. var. Himalaya (Simla to NEFA), Assam, Manipur, Burma, Indo-China, China, and Formosa.

Viscum monoicum Roxb. ex DC., Prodr. **4**: 278 (1830)–Fl. Brit. Ind. **5**: 224 (1886)–Danser in Blumea **4**: 305 (1941)–Seshagiri Rao in Journ. Ind. Bot. Soc. **36**: 160 (1957).

Siliguri, 400 m (Jun. 29, 1960, fl.).

Distr. India, Burma, Thai, and Indo-China.

BALANOPHORACEAE (by Hiroshi Hara)

Balanophora dioica R. Brown [in Trans. Linn. Soc. **13**: 227 (1822), in nota, nom. nud.–Wall., Cat. no. 7246 (1832), nom. nud.] ex Royle, Ill. Bot. Himal. 330 (1836); t. 99. 2 (1839)–Hook. f. in Trans. Linn. Soc. **22**: 45 (1856)–Fl. Brit. Ind. **5**: 237 (1886).

B. picta, *B. alveolata*, *B. burmanica* et *B. affinis* Griffith in Trans. Linn. Soc. **20**: 94 & 95, t. 3–6 (1851).

Below Ranga Pani, 400–700 m (Dec. 8, 1963, fl. ♀ & ♂).

Distr. E. Himalaya (Nepal), Khasia, Mishmi, Manipur, Burma, and Formosa?

Balanophora involucrata Hooker f. in Trans. Linn. Soc. **22**: 44, t. 4-6 (1856)-Fl. Brit. Ind. **5**: 237 (1886).

Diorali Bhanjang, 3400 m (Nov. 14, 1963, fl.).

Distr. Himalaya (Simla to Sikkim).

Balanophora polyandra Griffith in Trans. Linn. Soc. **20**: 94, t. 7 (1846)-Hook f., l.c. **22**: 47 (1856)-Fl. Brit. Ind. **5**: 238 (1886).

Acroblastum polyandrum (Griff.) Setchell in Univ. Calif. Publ. Bot. **19**: 147 (1935).

Bilbatay Bhanjang, 2200 m (Oct. 26, 1963, fl.); Tuwa-Taplethok, 1800-1400 m (Nov. 5, 1963, fl.); Taplethok-Helok, 1400-1500 m (Nov. 6, 1963, fl.); Helok, 1500 m (Nov. 8, 1963, fl.); Iladanda-Salap, 1800-2600 m (Nov. 9, 1963, fl.); Zongi-Iladanda, 2800-1800 m (Nov. 12, 1963, fl.); Thakma Khola, 2500-3000 m (Nov. 12, 1963, fl.); Birwa-Yektin, 2900-1400 m (Nov. 28, 1963, fl.).

Distr. E. Himalaya (Nepal, Sikkim), Khasia, and W. China.

Rhopalocnemis phalloides Junghuhn in Nov. Act. Acad. Caes. Nat. Cur. **18**, suppl. 1: 215 (1841)-Hook. f. in Trans. Linn. Soc. **22**: 52, t. 12 (1856)-Fl. Brit. Ind. **5**: 239 (1886)-Harms in Engl., Pfl.-fam. ed. 2, **16 b**: 323, f. 163 A-E (1935).

Phaeocordylis areolata Griffith in Trans. Linn. Soc. **20**: 100, t. 8 (1851).

Sinduwa-Chitray, 2100 m (Oct. 24, 1963); Bilbatay Bhanjang, 2200 m (Oct. 25, 1963, defl.).

Distr. E. Himalaya (Nepal, Sikkim), Khasia, and Malay Is.

ARISTOLOCHIACEAE (by Hiroshi Hara)

Aristolochia Griffithii Hook. f. et Thoms. ex Duchartre in DC., Prodr. **15** (1): 437 (1864)-Fl. Brit. Ind. **5**: 77 (1886)-Spring Fl. Sikkim Himal. f. 173 (1963).

Isotrema Griffithii (Hook. f. et Thoms.) C.E.C. Fischer in Kew Bull. **1940**: 198.

Ramam-Phalut, 2600 m (May 9, 1960, fl.); Diorali Bhanjang, 2900 m (Nov. 14 & 17, 1963).

Distr. E. Himalaya (Nepal to NEFA).

Aristolochia Roxburghiana Klotzsch in Monatsb. Akad. Berl. **1859**: 596 (1859)-Fl. Brit. Ind. **5**: 75 (1886).

A. acuminata (non Lamarck 1783) Roxburgh, Fl. Ind. ed. 2, **3**: 489 (1832).

Chyangthaphu-Birwa, 1300-2400 m (Nov. 27, 1963, fr.).

Distr. E. Himalaya (Nepal, Sikkim), Assam, India, Ceylon, and Malaysia.

Asarum himalaicum Hook. f. et Thoms. ex Klotzsch in Monatsb. Akad. Berl. **1859**: 585 (1859), ut *himalaycum*-Duchartre in DC., Prodr. **15** (1): 424 (1864)-Fl. Brit. Ind. **5**: 72 (1886). [Fig. 12]

Garibans-Tonglu, 2850 m (Jun. 7, 1960, no. 704, fl.); Thakma Khola-Diorali Bhanjang, 3000-3300 m (Nov. 12 & 16, 1963).

Distr. E. Himalaya (Nepal to Bhutan).

The species belongs to the genus *Asarum* in a strict sense. The perianth-lobes are minutely strigose on the inner surface, the ovary is semi-inferior, the style is thick and columnar, and the stamens have a long filament and a short connective. The number of chromosomes is 2n=26 (see Kurosawa on page 659).

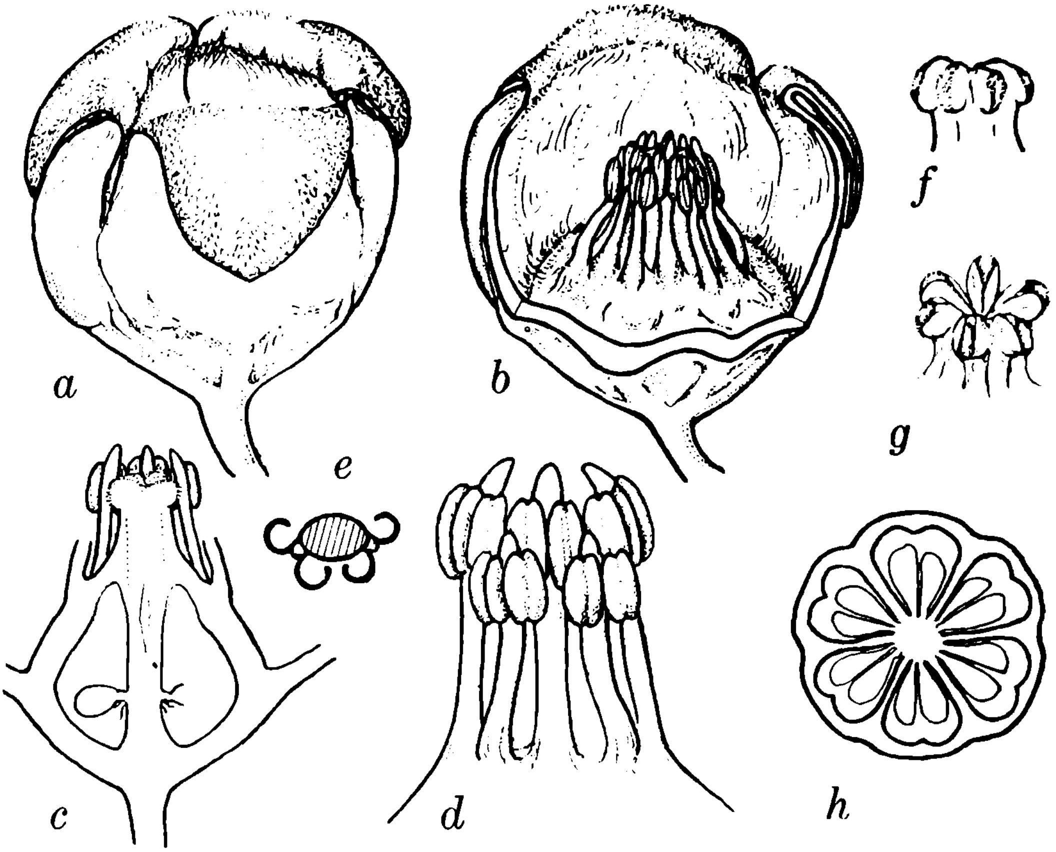

Fig. 12. *Asarum himalaicum* Hook. f. et Thoms.
a. Flower, ×4. b. The same, a part of calyx removed, ×4. c. Longitudinal section of pistil and stamens, ×4. d. Stamens, ×8. e. Cross section of anther. f, g. Stigmas, ×8. h. Cross section of ovary, ×4.

POLYGONACEAE (by Hiroshi Hara)

The generic segregation in the family is discussed on page 631.

Aconogonum campanulatum (Hook. f.) Hara, comb. nov.

Polygonum campanulatum Hooker f., Fl. Brit. Ind. **5**: 51 (1886)–Bot. Mag. t. 9098 (1926)–Steward in Contr. Gray Herb. **88**: 104 (1930).

Reynoutria campanulata (Hook. f.) Moldenke in Bull. Torrey Bot. Cl. **68**: 675 (1941).

Sandakphu–Tonglu, 2800–3000 m (Jun. 7, 1960 & Sep. 17, 1964, fl.); Zongi–Iladanda, 2800–1800 m (Nov. 12, 1963, fl.); Baroya Khimty–Thakma Khola, 2500–3200 m (Nov. 12, 1963, fl., fr.); Thakma Khola–Diorali Bhanjang–Bhandukay, 3000–2500 m (Nov. 14 & 17, 1963, fl., fr.).

var. **fulvidum** (Hook. f.) Hara, comb. nov.

P. crispatum C. B. Clarke in Journ. Linn. Soc. **15**: 138 (1876), excl. basionym.

P. campanulatum var. *fulvidum* Hook. f., Fl. Brit. Ind. **5**: 52 (1886), ut *fulvida*–Steward, l.c. (1930).

Sinduwa–Chitray, 2100 m (Oct. 24, 1963, fl., fr.); Hati Sar–Minchin Dhap, 2700–2900 m (Oct. 28, 1963, fl.); Minchin Dhap–Pul Pokhari, 2900–2500 m (Oct. 29, 1963, fl., fr.); Lagyap, 2200 m (Sep. 13, 1964, fl.); Tonglu–Sandakphu, 2800–3500 m (Sep. 16, 1964, fl.).

Distr. sp. Himalaya (Kumaon to Sikkim), Naga Hills, S. Tibet, and W. China.

In this species, the hairiness is exceedingly variable. The variety *fulvidum* may represent a distinct species.

Aconogonum molle (D. Don) Hara, comb. nov.

Polygonum molle D. Don, Prodr. Fl. Nepal. 72 (Feb. 1825)–Fl. Brit. Ind. **5**: 50 (1886)–Spring Fl. Sikkim Himal. f. 164 (1963).

Coccoloba Totnea D. Don, l.c. 74 (1825).

Ampelygonum molle (D. Don) Roberty et Vautier in Boissiera **10**: 31 (1964).

var. **molle**.

Yoksam–Bakkim, 2200 m (May 18, 1960, bud); Darjeeling, 2000 m (Jun. 21, 1960, fl.); Kakani, 2100 m (Sep. 24, 1963, fl., fr.); Taplethok, 1400 m (Nov. 5, 1963, fl.); Yamphodin–Ghatte, 2100–1600 m (Nov. 18, 1963, fl.); Penlong La, Gangtok, 2000 m (Jun. 16, 1960 & Sep. 13, 1964, fr.).

var. **frondosum** (Meisn.) Hara, comb. nov.

Polygonum paniculatum Blume, Bijdr. 533 (Dec. 1825–Mar. 1826)–Fl. Brit. Ind. **5**: 49 (1886)–Steward, l.c. 105 (1930), p.p.

P. frondosum Meisn. in DC., Prodr. **14**: 137 (1856).

P. paniculatum var. *frondosum* (Meisn.) Steward, l.c. 106 (1930).

Sinduwa, 2100 m (Oct. 23, 1963, fr.); Sinduwa–Chitray, 2000–2100 m (Oct. 24, 1963, fr.); Bilbatay Bhanjang, 2200 m (Oct. 25, 1963, fr.); Minchin Dhap–Mul Pokkari (Oct. 29, 1963 fl.); Baroya Khimty, 2500 m (Nov. 11, 1963, fr.) Chyangthaphu–Birwa (Nov. 27, 1963, fr.); Batasay–Bhuspate Danra, 2400–2800 m (Dec. 1, 1963 fr.); Mai Majuwa–Dhara Pani (Dec. 4, 1963, fl.); Darjeeling, 2200 m (Dec. 26, 1963, fr.); Lagyap, 2200 m (Sep. 13, 1964, fl.); Gatribas–Tonglu (Sep. 17, 1964, fl.).

var. **sikkimense** (Hook. f.) Hara, comb. nov.

Polygonum rude var. *sikkimensis* Hook. f., Fl. Brit. Ind. **5**: 50 (1886).

Bhuspate Danra–Mai Majuwa, 3100–2000 m (Dec. 3, 1963, fr.).

var. **rude** (Meisn.) Hara, comb. nov.

Polygonum rude Meisn. in DC., Prodr. **14**: 137 (1856)–Fl. Brit. Ind. **5**: 49 (1886).

P. paniculatum var. *rude* (Meisn.) Steward, l.c. 106 (1930).

P. deflexipilosum Kitamura in Act. Phytotax. Geobot. **15**: 129 (1954); Faun. & Fl. Nepal Himal. 116, f. 15 (1955).

Darjeeling, 2100 m (Sep. 21, 1964, fl.).

Distr. sp. Himalaya (Garhwal to NEFA), Khasia, Malaysia, Indo-China, and W. China.

The species is exceedingly variable in the hairiness. Typical *A. molle* has densely hirsute stems and petioles with long appressed hairs, and densely pubescent leaves and rachis of inflorescences. Whereas the specimens referred to var. *frondosum* are glabrous in all parts. Typical var. *rude* has hirsute stems and petioles with long retrorsely appressed hairs, and pubescent leaves and panicles. Var. *sikkimense* is glabrescent but has stems with retrorse hairs only below the nodes. A specimen from (Chia Bhanjang–Dentam, May 11, 1960, no. 183) has very minutely pilose stems and panicles, but has almost glabrous leaves. The fruiting perianths of this species are, in full mature, succulent and black.

Bilderdykia pterocarpa (Wall.) Greene, Leafl. **1**: 23 (1904).

Polygonum pterocarpum Wallich ex Meisn. in Wallich, Pl. Asia. Rar. **3**: 62 (1832)–Fl. Brit. Ind. **5**: 54 (1886)–Steward, l.c. 94 (1930), p.p.

Taplejung–Garhi Danra, 1900–2200 m (Nov. 3, 1963, fr.); Tuwa–Tuplethok, 1800–1400 m (Nov. 5, 1963, fl., fr.); above Helok, 1700 m (Nov. 10, 1963, fr.); Iladanda–Helok, 1800–1500 m (Nov. 13, 1963, fr.); Yektin–Batasay, 1400–2400 m (Nov. 30, 1963, fr.).

Distr. Himalaya (Kashmir to Sikkim).

Bistorta amplexicaulis (D. Don) Greene, Leafl. **1**: 21 (1904).

Polygonum amplexicaule D. Don, Prodr. Fl. Nepal. 70 (1825)–Fl. Brit. Ind. **5**: 32 (1886)–Steward, l.c. 30 (1930).

Migothang, 3900 m (May 31, 1960, fr.); Nayathang–Phalut, 3500 m (Jun. 2, 1960, no. 737); Kala Pokhari–Sandakphu, 3500 m (Sep. 16, 1964, fl.).

Distr. sp. Afghanistan, Himalaya (Kashmir to Bhutan), and W. & C. China.

Bistorta Emodi (Meisn.) Hara, comb. nov.

Polygonum Emodi Meisner in Wall., Pl. Asia. Rar. **3**: 51, t. 287 (1832)–Fl. Brit. Ind. **5**: 33 (1886)–Steward, l.c. 29 (1930).

Thakma Khola, 3000–3300 m (Nov. 13, 14, 16 & 17, 1963, fr.); Walunchung Gola–Zongi, 3800–2800 m (Nov. 11, 1963).

Distr. Himalaya (Simla to Sikkim), and W. China.

Bistorta vaccinifolia (Wall.) Greene, Leafl. **1**: 21 (1904).

Polygonum vaccinifolium Wallich ex Meisner in Wall., Pl. Asia. Rar. **3**: 54 (1832)–Fl. Brit. Ind. **5**: 33 (1886)–Steward, l.c. 27 (1930).

Jongri, 3500–4000 m (May 19 & 21, 1960, fr.); Jongri–Olothang, 3900 m (May 23, 1960); Gamothang–Migothang, 3500 m (May 30, 1960, no. 577); Migothang, 3900 m (May 31, 1960).

Distr. Himalaya (Kashmir to Bhutan), Manipur, and W. Tibet.

Fagopyrum dibotrys (D. Don) Hara, comb. nov.

Polygonum dibotrys D. Don, Prodr. Fl. Nepal. 73 (1825).

P. cymosum Treviranus [Del. Sem. Hort. Vrat. (1824), nom. nud.] in Nov. Act. Acad. Caes. Leop.-Carol. Nat. Cur. **13**: 177 (1826)–Steward, l.c. 117 (1930).

Fagopyrum cymosum (Trev.) Meisn. in Wall., Pl. Asia. Rar. **3**: 63 (1832)–Fl. Brit. Ind. **5**: 55 (1886).

Taplejung, 1700 m (Nov. 2, 1963, fl.); Iladanda–Helok, 1800–1500 m (Nov. 13, 1963, fr.).

Distr. Himalaya (Kashmir to Sikkim), Khasia, Manipur, Tibet, Thai, Tonkin, and China.

Fagopyrum esculentum Moench, Meth. 290 (1794)–Fl. Brit. Ind. **5**: 55 (1886).

Polygonum Fagopyrum L., Sp. Pl. ed. 1, **1**: 364 (1753)–Steward, l.c. 116 (1930).

Fagopyrum sagittatum Gilibert, Exerc. Phyt. **2**: 435 (1792), nom. illegit.

Polygonum emarginatum Roth, Catal. Bot. **1**: 48 (1797).

Nissim–Dumhan, 1000 m, cult. (Oct. 30, 1963, fl.); Khebang, 1700 m (Nov. 23, 1963, fr.); Taplejung, 1900 m, cult. in Tokyo (Jun. 6, 1964, fl.).

Distr. Temperate Eurasia; widely cultivated.

Fagopyrum tataricum (L.) J. Gaertner, Fruct. et Sem. **2**: 182, t. 119, f. 6 (1791)- Fl. Brit. Ind. **5**: 55 (1886).

Polygonum tataricum L., Sp. Pl. ed. 1, **1** : 364 (1753)-Steward, l.c. 114 (1930).

Yoksam, 1700 m, cult. (May 16, 1960, fl.); Murhay, 2000 m, cult. (Oct. 22 & 23, 1963, fl., fr.); Taplethok-Helok, 1400-1500 m (Nov. 6, 1963, fr.); Khunga Chuli, 2000 m, cult. (Nov. 27, 1963, fr.).

Distr. Temperate Eurasia; often cultivated.

Koenigia delicatula (Meisn.) Hara, comb. nov.

Polygonum delicatulum Meisn. in DC., Prodr. **14**: 127 (1856)-Fl. Brit. Ind. **5**: 24 (1886)-Steward, l.c. 80 (1930).

Kala Pokhari-Sandakphu, 3400-3500 m (Sep. 16 & 17, 1964, fl.).

Distr. Himalaya (Kashmir to Bhutan), S. Tibet, and W. China.

Koenigia nepalensis D. Don, Prodr. Fl. Nepal. 74 (1825).

Polygonum filicaule Wall. ex Meisn. in Wall., Pl. Asia. Rar. **3**: 59 (1832)-Fl. Brit. Ind. **5**: 25 (1886)-Steward, l.c. 79 (1930).

Kala Pokhari-Sandakphu, 3500 m (Sep. 16, 1964, fl.).

Distr. Himalaya (Kashmir to Sikkim), Tibet, W. China, and Formosa.

Oxyria digyna (L.) Hill, Hort. Kew. 158 (1769)-Fl. Brit. Ind. **5**: 58 (1886).

Rumex digynus L., Sp. Pl. ed. 1, **1** : 337 (1753).

Preig Chu, Jongri-Olothang, 3900 m (May 23, 1960, fr.).

Distr. Europe, Asia Minor, C. Asia, Siberia, Himalaya, Tibet, Mongolia, W. China, Japan (alpine regions, rare), N. America, and Greenland.

Persicaria barbata (L.) Hara, comb. nov.

Polygonum barbatum L., Sp. Pl. ed. 1, **1** : 362 (1753)-Fl. Brit. Ind. **5**: 37 (1886)-Steward, l.c. 52 (1930).

P. hispidum Hamilt. ex D. Don, Prodr. Fl. Nepal. 71 (1825).

Dhara Pani-Tamur Bridge, 600 m (Oct. 17, 1963, fr.); Ranga Pani-Ghorwa, 700-300 m (Dec. 9, 1963); Kathgara-Rangali, 200 m (Dec. 14, 1963, fr.).

Distr. Africa, Afghanistan, Himalaya, India, Malaysia, east to China and S. Japan.

Persicaria capitata (Hamilt.) H. Gross in Engl., Bot. Jahrb. **49**: 277 (1913).

Polygonum capitatum Hamilton ex D. Don, Prodr. Fl. Nepal. 73 (1825)-Fl. Brit. Ind. **5**: 44 (1886)-Steward, l.c. 78 (1930).

Gangtok, 1600 m (Jun. 16, 1960, fr.); Pamianchi-Tingling Bridge, 2000-1000 m (May 15, 1960, no. 283, fr.); Siliguri-Kurseong (Apr. 29, 1960, fl.); Butia Basti, 2000 m (Apr. 6, 1960, fl.); Sanguri Bhanjang, 1200 m (Oct. 16, 1963, fl., fr.); Garhi Danra-Tuwa, 2200-1800 m (Nov. 4, 1963, fl.); Iladanda-Selap, 1800-2600 m (Nov. 9, 1963, fl.); Siling Tzokupa-Khebang, 2100-1700 m (Nov. 22, 1963, fl.); Yektin-Akasay, 1400-2300 m (Nov. 30, 1963, fl.); Darjeeling, 2100 m (Dec. 28, 1963, fl.).

Distr. Himalaya (Punjab to Bhutan), Assam, N. Burma, Tibet, Indo-China, and W. China.

Persicaria chinensis (L.) H. Gross in Engl., Bot. Jahrb. **49**: 269, 277 & 315 (1913).

Polygonum chinense L., Sp. Pl. ed. 1, **1** : 363 (1753)-Fl. Brit. Ind. **5**: 44 (1886)-Steward, l.c. 70 (1930).

Ampelygonum chinense (L.) Lindley in Bot. Reg. **24**: Misc. 62 (1838).

var. **brachiata** (Lam.) Hara, comb. nov.

Polygonum brachiatum Lamarck, Ill. **2**: t. 315, f. 4 (1797); Encycl. Méth. **6**: 150 (1806); Tabl. Encycl. **2**: 445 (1819?).

P. patens D. Don, Prodr. Fl. Nepal. 73 (1825).

P. chinense δ. brachiatum (Lam.) Meisner, l.c. 61 (1832).

Gangtok, 1600m (Jun. 16, 1960, fr.); Chia Bhanjang–Dentam, 3100–1400m (May 11, 1960, no. 241, fl.); Tonglu–Mani Bhanjang, 2200m (Jun. 8, 1960, fl.); Murhay, 2000 m (Oct. 24, 1963, fl.); Sinduwa–Chitray, 2000–2100 m (Oct. 24, 1963, fr.); Bilbatay Bhanjang, 2200 m (Oct. 25, 1963, fl.); Baroya Khimty, 2500 m (Nov. 11, 1963, fl.); Darjeeling, 2100–2200 m (Dec. 25 & 26, 1963; Sep. 10, 1964); Senchal, 2300 m (Dec. 27, 1963, fr.).

var. **ovalifolia** (Meisn.) Hara, comb. nov.

Polygonum auriculatum Meisn., Monogr. Polyg. 59, t. 6 (1826).

P. chinense β. ovalifolium Meisn. in Wall., Pl. Asia. Rar. **3**: 60 (1832).

Pouwa, Kathmandu, 1600 m (Oct. 9, 1963, fl.); Dhankuta, 1200 m (Oct. 20, 1963, fl.); Tuwa–Taplethok, 1800–1400 m (Nov. 5, 1963, fl.); Khebang–Bharomdin, 1700–1000 m (Nov. 24, 1963, fl., fr.); Bharomdin–Tharpu, 700–1200 m (Nov. 25, 1963, fl.); Mai Majuwa–Dhara Pani, 1600–1500 m (Dec. 4, 1963, fl.); Illam–Ranga Pani, 1200–400 m (Dec. 8, 1963, fr.); Darjeeling, 2100 m (Dec. 28, 1963, fl.).

Distr. sp. India, Burma, Thai, east to China and S. Japan, and Malaysia.

The relations between the Himalayan and Japanese races are explained on page 633.

Persicaria Kawagoeana (Makino) Nakai in Rigakkai **24**: 300 (1926)–I. Ito in Journ. Jap. Bot. **31**: 173 & 177 (1956).

Polygonum minus Hudson sensu Fl. Brit. Ind. **5**: 36 (1886)–Steward, l.c. 63 (1930), p.p.

P. Kawagoeanum Makino in Bot. Mag. Tokyo **28**: 115 (1914).

Persicaria minor Opiz var. *Kawagoeanum* (Mak.) Masamune in Sci. Rep. Kanazawa Univ. **2** (2): 80 (1954).

Rayang, 250 m (Apr. 20, 1960, fl., fr.); Taplejung–Bunklung, 1900–2100 m (Nov. 3, 1963, fl.); Khebang, 1700 m (Nov. 23, 1963, fl.); Khebang–Bharomdin, 1700–1000 m (Nov. 24, 1963, fr.).

Distr. Himalaya, India, China, Malaysia?, Formosa, and S. Japan.

The achenes are biconvex, and about 1.2 mm long. The group of this plant in Asia needs a critical revision.

Persicaria limbata (Meisn.) Hara, comb. nov.

Polygonum limbatum Meisner in DC., Prodr. **14**: 123 (1856)–Fl. Brit. Ind. **5**: 30 (1886)–Steward, l.c. 42 (1930).

Sibganja–Mahara Bahara, 200 m (Dec. 12, 1963); Mahara Bahara–Kathgara, 200 m (Dec. 13, 1963, fl.).

Distr. Tropical Africa, and India.

Persicaria longiseta (De Bruyn) Kitagawa in Rep. Inst. Sci. Manch. **1** (8): 322 in nota (1937).

Polygonum longisetum De Bruyn in Miq., Pl. Jungh. 307 (1854).

P. caespitosum var. *longisetum* (De Bruyn) Steward, l.c. 67 (1930).

Dhankuta, 1200 m (Oct. 19, 1963, fl., fr.).

Distr. Himalaya, China, Japan, and Malaysia.

The plants of Dhankuta have narrower lanceolate leaves, and rosy flowers, and much resemble *P. erecto-minor* (Makino) Nakai var. *trigonocarpa* (Makino) Hara, but they lack discoid dots on the underside of leaves and on perianths.

Persicaria microcephala (D. Don) H. Gross in Engl., Bot. Jahrb. **49**: 277 (1913).

Polygonum microcephalum D. Don, Prodr. Fl. Nepal. 72 (1825)–Steward, l.c. 76 (1930).

Butia Basti, Darjeeling, 2000 m (Apr. 6, 1960, fl.); Takdah, 1700 m (Apr. 19, 1960, no. 1949, fl.); Kalimpong, 1300 m (Apr. 23, 1960, fl.); Gangtok, 1600 m (Apr. 26, 1960; Mar. 23, & Sep. 13, 1964, fl.); Peshok, 900 m (Apr. 27, 1960, no. 2324, fl.); Saramsa, 800 m (Jun. 17, 1960, fl.); Kathmandu, 1400 m (Sep. 23, 1963, fl.); Taplejung, 1700 m (Nov. 2, 1963, fr.); Tharpu, 1200 m (Nov. 26, 1963, fl.).

var. **Wallichii** (Meisn.) Hara, comb. nov.

Polygonum Wallichii Meisn., Monogr. Polyg. 83, t. 7, fig. 1 (1826)–Steward, l.c. 76 (1930).

Pamianchi, 2000 m (May 14, 1960, fl.); Senchal–Tiger Hill, 2400–2500 m (Jun. 23, 1960, fl.); Yektin–Akasay, 1400–2300 m (Nov. 30, 1963).

Distr. sp. E. Himalaya (Nepal, Sikkim), Khasia, Manipur, Naga Hills, and W. & C. China.

Persicaria nepalensis (Meisn.) H. Gross in Engl., Bot. Jahrb. **49**: 277 (1913).

Polygonum punctatum (non Elliot 1817, nec Rafin. 1820) Hamilton ex D. Don, Prodr. Fl. Nepal. 72 (1825), cum *β. alatum.*

Polyg. nepalense Meisner, Monogr. Polyg. 84, t. 7, fig. 2 (1826)–Danser, l.c. 201 (1927)–Steward, l.c. 74 (1930).

Polyg. alatum Hamilt. ex Sprengel, Syst. Veg. Cur. Post. 154 (1827)–Fl. Brit. Ind. **5**: 41 (1886).

Polyg. alatum var. *nepalense* (Meisner) Hooker f., l.c. 42 (1886).

Polyg. quadrifidum Hayata, Mater. Fl. Formos. 233 (1911), e typo.

Takdah, 1600 m (Apr. 18, 1960, no. 1976, fl., fr.); Gangtok, 1650 m (Apr. 26 & Jun. 14, 1960, fl., fr.); Rimbick, 2200 m (May 5, 1960, fr.); Godavari, Kathmandu, 1500 m (Sep. 18, 1963, fl.); Kakani, 2100–2200 m (Sep. 24, 1963, fl.); Sanguri Bhanjang, 1200 m (Oct. 16, 1963, fl.); Dhankuta, 1200 m (Oct. 20, 1963, fl.); Murhay, 2100 m (Oct. 3, 1963, fl.); Taplethok–Helok, 1400–1500 m (Nov. 6, 1963, fl.); Baroya Khimty, 2500 m (Nov. 12, 1963, fl.); Tharpu, 1200 m (Nov. 26, 1963, fl.); Darjeeling, 2150 m (Sep. 10, 1964, fl.).

Distr. Tropical Africa, Afghanistan, Himalaya, India, Ceylon, Malaysia (incl. New Guinea), east to China, Korea, and Japan.

The flowers are purple, pink, or sometimes white. The achenes are biconvex, but a few white-flowered plants have trigonous achenes resembling *P. microcephala* and may be a hybrid between *P. nepalensis* and *P. microcephala.*

Persicaria perfoliata (L.) H. Gross in Engl., Bot. Jahrb. **49**: 275 & 281 (1913).

Polygonum perfoliatum L., Sp. Pl. ed. 2, 521 (1763)–Fl. Brit. Ind. **5**: 46 (1886)–Steward, l.c. 81 (1930).

Ampelygonum perfoliatum (L.) Roberty et Vautier in Boissiera **10**: 31 (1964).

Saramsa near Gangtok, 800 m (Jun. 17, 1960, fr.); Kathmandu, 1600 m (Sep. 17 & Oct. 13, 1963, fr.); Dumhan-Taplejung, 700-1900 m (Nov. 1, 1963, fr.); Taplejung-Garhi Danra, 1900-2200 m (Nov. 3, 1963, fr.); Tharpu-Chyangthaphu, 1200-1300 m (Nov. 26, 1963, fr.); Tharpu, 1200 m (Nov. 26, 1963, fr.).

Distr. India, Himalaya, Malaysia, China, Amur, Korea, Formosa, and Japan.

Persicaria polystachya (Wall.) H. Gross in Engl., Bot. Jahrb. **49**: 315 (1913).

Polygonum polystachyum Wallich ex Meisner in Wallich, Pl. Asia. Rar. **3**: 61 (1832)-Fl. Brit. Ind. **5**: 50 (1886)-Steward, l.c. 109 (1930).

Polyg. molle D. Don sensu Wight, Icon. **5**: t. 1807 (1852).

Reynoutria polystachya (Wall.) Moldenke in Bull. Torrey Bot. Cl. **68**: 675 (1941).

Jongri 4000 m (May 23, 1960, fr.); Selap-Walunchung Gola, 2600-3800 m (Nov. 10, 1963, fr.); Baroya Khimty-Thakma Khola, 2600 m (Nov. 12 & 16, 1963, fr.); Diorali Bhanjang, 3500 m (Nov. 14, 1963, fr.); Kala Pokhari-Sandakphu, 3400 m (Sep. 16, 1964, fl.).

Distr. Afghanistan, Himalaya (Kashmir to Sikkim), S. Tibet, and W. China.

Persicaria Posumbu (D. Don) H. Gross in Engl., Bot. Jahrb. **49**: 313 (1913).

Polygonum Posumbu Hamilton ex D. Don, Prodr. Fl. Nepal. 71 (Feb. 1, 1825)-Meinsner, Monogr. Polyg. 73 (1826)-Fl. Brit Ind. **5**: 38 (1886), p.p.

Polyg. caespitosum Blume, Bijdr. 532 (Dec. 1825-Mar. 1826)-Danser in Bull. Jard. Bot. Buitenz. ser. 3, **8**: 151 (1927), p.p.-Steward, l.c. 66 (1930), p.p.

Polyg. Donii α. tenerum Meisner in Wall., Pl. Asia. Rar. **3**: 58 (1832), p.p.

Polyg. Posumbu α. tenerum (Meisn.) Meisn. in DC., Prodr. **14**: 106 (1856), p.p.

Takdah, 1700 m (Apr. 19, 1960, fl.); Rayang, 250 m (Apr. 20 & 21, 1960, no. 1833 & 1840, fl.); Gangtok, 1600 m (Jun. 15, 1960, fl.); Rangpo-Tista, 400 m (Jun. 18, 1960, fr.); Gokarna, Kathmandu, 1500 m (Sep. 22, 1963, fl.); Pouwa, 1600 m (Oct. 9, 1963, fr.); Dumhan-Taplejung, 1400 m (Nov. 1, 1963, fl.); Garhi Danra-Tuwa, 2200-1800 m (Nov. 4, 1963, fr.); Khebang-Bharomdin, 1700-1000 m (Nov. 24, 1963, fl.); Tharpu-Chyangthaphu, 1200-1300 m (Nov. 26, 1963, fr.); Ranga Pani-Ghorwa, 700-300 m (Dec. 9, 1963, fl.); Sanichare-Sibganja, 200 m (Dec. 11, 1963, fr.).

Distr. Himalaya (Kashmir to Bhutan), Assam, Indo-China, Malaysia, China, and Formosa.

Persicaria praetermissa (Hook. f.) Hara, comb. nov.

Polygonum praetermissum Hook. f., Fl. Brit. Ind. **5**: 47 (1886)-Steward, l.c. 86 (1930).

P. auriculatum (non Meisn. 1826) Makino in Bot. Mag. Tokyo **17**: 117 (1903).

Persicaria hastato-auriculata (Makino) Nakai in Rigakkai **24**: 299 (1926).

Mai Pokhari, 1600 m (Dec. 4, 1963, bud).

Distr. Himalaya, Khasia, Ceylon, Burma, Tonkin, China, Formosa, Japan, and Philippines.

Persicaria pubescens (Blume) Hara in Journ. Jap. Bot. **17**: 335 (1941).

Polygonum pubescens Blume, Bijdr. **11**: 532 (1825)-Danser in Bull. Jard. Bot. Buitenz. ser. 3, **8**: 193 (1927).

P. Donii Meisner, Monogr. Polyg. 72 (1826).

P. flaccidum var. *hispida* Hook. f., Fl. Brit. Ind. **5**: 40 (1886), excl. syn.

P. Hydropiper var. *hispidum* (Hook f.) Steward, l.c. 60 (1930), excl. syn. nonnul.

var. **acuminata** (Franch. et Sav.) Hara, l.c. 335 (1941).

Polygonum flaccidum (non Roxb. 1832) sensu Meisner in DC., Prodr. **14** (1): 107 (1856)–Fl. Brit. Ind. **5**: 39 (1886),

P. Hydropiper α. acuminata Franch. et Sav., Enum. Pl. Jap. **2**: 474 (1877).

P. Hydropiper subsp. *microcarpum* var. *triquetrum* Danser, l.c. 189 (1927).

P. Hydropiper var. *flaccidum* (Meisn.) Steward, l.c. 59 (1930).

Tingling Bridge–Yoksam, 1000–1700 m (May 16, 1960, fr.); Gangtok, 1600 m (Jun. 15, 1960, fr.); Godavari, Kathmandu, 1500m (Sep. 18, 1963, fl., fr.); Dhankuta, 1200 m (Oct. 19, 1963, fl., fr.); Yektin–Akasay, 1400–2300 m (Nov. 30, 1963, fr.).

Distr. Himalaya, India, east to China and Japan, and south to Malaysia, and Australia.

Some of our Himalayan specimens agree well with the Japanese ones, but the Indian specimens show a wider range of variations. Typical *P. pubescens* of Java is a robust plant with large leaves densely hirsute on both surfaces, denser spikes, and flowers 3.5–4 mm long. The critical revision of the group is much needed.

Persicaria punctata (Elliot) Small, Fl. S. E. U. S. 379 (1903).

Polygonum punctatum Elliot, Bot. S. Carol. & Georg. **1**: 455 (1817)–Fassett in Brittonia **6**: 369 (1949).

var. **breviciliata** (Meisn.) Hara, comb. nov.

Polygonum acre β. breviciliatum Meisner in Wallich, Pl. Asia. Rar. **3**: 57 (1832).

P. punctatum var. *breviciliatum* (Meisn.) Steward, l.c. 63 (1930).

Biratnagar, 200 m (Oct. 14, 1963, fr.); Sanichare–Sibganja, 200 m (Dec. 11, 1963, fr.); Mahara Bahara–Kathgara, 200 m (Dec. 13, 1963, fr.); Rangali–Biratnagar, 200 m (Dec. 15, 1963, fr.).

Distr. sp. Tropical Himalaya (Punjab, Nepal), N. India, and N., C. & S. Americas.

Our specimens agree well with Meisner's *β. breviciliatum*, and have shinning trigonous achenes. But the relation between the Himalayan and American plants needs reexamination.

Persicaria runcinata (Hamilt.) H. Gross in Engl., Bot. Jahrb. **49**: 277 (1913).

Polygonum runcinatum Hamilton ex D. Don, Prodr. Fl. Nepal. 73 (1825)–Fl. Brit. Ind. **5**: 43 (1886)–Danser, l.c. 205, f. 12 (1927)–Steward, l.c. 73 (1930).

Polyg. morrisonense Hayata, Fl. Mont. Formos. 185, t. 31 (1908), e typo.

Pers. runcinata (D. Don) Migo in Bull. Shanghai Sci. Inst. **14**: 18 (1944).

Darjeeling, 1900 m (Apr. 3 & Jun. 25, 1960, fl., fr.); Rimbick, 2200 m (May 5, 1960, fl.); Chia Bhanjang, 3100 m (Jun. 2, 1960); Kakani, 2100 m (Sep. 24, 1963, fl.); Dhankuta–Hilay, 1200–1700 m (Oct. 20 & 23, 1963, fl., fr.); Bilbatay Bhanjang–Hati Sar, 2700–2200 m (Oct. 27, 1963, fl.); Taplejung, 1700 m (Nov. 2, 1963, fl.); Baroya Khimty, 2500 m (Nov. 12, 1963, fl.); Temi, 1700 m (Mar. 28, 1963, fl.).

Distr. Himalaya, Khasia, Burma, Thai, W. & C. China, Formosa, and Malaysia.

Persicaria Thunbergii (Sieb. et Zucc.) H. Gross in Engl., Bot. Jahrb. **49**: 275 (1913).

Polygonum Thunbergii Sieb. et Zucc. in Abh. Akad. Wiss. Muench. **4** (3): 208 (1846)–Steward, l.c. 83 (1930).

var. **hastata** (Meisn.) Hara, comb. nov.

Polygonum debile Meisn. β. *hastatum* Meisn. in Miq., Ann. Mus. Lugd.-Bat. **2**: 63 (1865).

Polygonum Thunbergii var. *oreophilum* Makino in Bot. Mag. Tokyo **27**: 251 (1913).

Persicaria Thunbergii var. *oreophila* (Makino) Nemoto, Fl. Jap. Suppl. 176 (1936).

Pers. oreophila (Makino) Hiyama in Journ. Jap. Bot. **34**: 340 (1959).

Bilbatay Bhanjang, 2200 m (Oct. 26, 1963, fl., fr.); Mai Majuwa–Dhara Pani, 1900–1500 m (Dec. 4, 1963, fl., fr.).

Distr. Himalaya, Khasia, Burma, Indo-China, China, and Japan.

The Himalayan specimens have diffuse branches, thin broadly hastate leaves sparsely hairy on both sides, unwinged petioles, membraneous ochreae, few-flowered heads, smaller flowers, and smaller trigonous lustrous achenes 3 mm long, and are near to var. *oreophila* of Japan. But the relationships with other varieties such as var. *stolonifera* (Fr. Schm.) Nakai, and var. *coreana* (Lév.) Nakai need further studies.

Polygonum plebejum R. Brown, Prodr. Fl. Nov. Holl. 420 (1810)–Fl. Brit. Ind. **5**: 27 (1886)–Steward, l.c. 24 (1930).

Rayang, 250 m (Apr. 20, 1960, fl.); Kalimpong, 1300 m (Jun. 20, 1960, fl., fr.); Taplethok–Helok, 1400–1500 m (Nov. 6, 1963, fl.); Ghorwa–Sanichare, 300–200 m (Dec. 10, 1963, fl.).

Distr. Africa, Afghanistan, Himalaya, India, east to China and Ryukyu, Malaysia, and Australia.

Rheum acuminatum Hook. f. et Thoms. in Bot. Mag. t. 4877 (1855)–Fl. Brit. Ind. **5**: 57 (1886).

Jongri–Gamothang, 4200–3600 m (May 26, 1960).

Distr. E. Himalaya (Sikkim).

Rheum nobile Hook. f. et Thoms., Ill. Himal. Pl. t. 19 (1855)–Fl. Brit. Ind. **5**: 57 (1886).

Jongri, 4400 m (May 22, 1960, no. 444); Oma La, 4400 m (May 30, 1960).

Distr. E. Himalaya (Nepal to Bhutan).

Rumex nepalensis Sprengel, Syst. Veg. **2**: 159 (1825)–Fl. Brit. Ind. **5**: 60 (1886)–Rechinger f. in Candollea **12**: 112, f. 2 A (1949)–Kitamura in Act. Phytotax. Geobot. **16**: 194 (1956).

Gangtok, 1600 m (Apr. 26 & Jun. 16, 1960, fr.; cult. in Tokyo, Jun. 22, 1964, fr.); Yoksam, 1800 m (May 17, 1960, no. 605, fl.); Darjeeling, 2000 m (Jun. 21, 1960, fl.); Helok–Baroya Khimty, 1500–2500 m (Nov. 10 & 15, 1963, fl., fr.); Iladanda–Helok (Nov. 13, 1963, fr.); Garhi Danra–Tuwa, 2200–1800 m (Nov. 4, 1963, fr.).

Distr. S. Europe (west to Italy), Asia Minor, Persia, Afghanistan, Himalaya, Nilghiri, Khasia, Manipur, Burma, Tonkin, W. & C. China, C. Japan, and Java.

Rumex vesicarius L., Sp. Pl. ed. 1, **1**: 336 (1753)–Fl. Brit. Ind. **5**: 61 (1886) –Rechinger f., l.c. 35 (1949).

Acetosa vesicaria (L.) A. Löve in Rep. Univ. Inst. Appl. Sci. Reykjavik, Dept. Agr. ser. B, **3**: 108 (1948).

Sibganja–Gauriganja, cult., 200 m (Dec. 12, 1963, fr.).

Distr. sp. N. Africa, Arabia, Persia, Afghanistan, and Punjab.

CHENOPODIACEAE (by Hiroshi Hara)

Chenopodium album L., Sp. Pl. ed. 1, **1** : 219 (1753)–Fl. Brit. Ind. **5**: 3 (1886).

Yoksam, 1700 m (May 17, 1960); Sanichare–Sibganja, 200 m (Dec. 11, 1963, fl.).

Distr. Almost cosmopolitan.

Chenopodium ambrosioides L., Sp. Pl. ed. 1, **1** : 219 (1753)–Fl. Brit. Ind. **5**: 4 (1886).

Kathmandu, 1400 m (Oct. 13, 1963, fl.); Dhankuta, 1200 m (Oct. 21, 1963, fl.); Dhankuta–Hilay, 1200–2000 m (Oct. 23, 1963, fr.); Khebang, 1400 m (Nov. 23, 1963, fr.).

Distr. Native of tropical America; widely naturalized.

AMARANTHACEAE (by Hiroshi Hara)

Achyranthes aquatica R. Brown, Prodr. Fl. Nov. Holl. 417 (1810)–Fl. Brit. Ind. **4**: 730 (1885).

Centrostachys aquatica (R. Br.) Wallich, Cat. no. 6932 (1829), nom. nud.–Moquin in DC., Prodr. **13** (2): 321 (1849)–Fl. Males. **4**: 87 (1949).

Kathgara–Rangali, 200 m (Dec. 14, 1963, fr.).

Distr. Tropical Africa (introd.?), Tropical Himalaya, India, Burma, Indo-China, Java, and Norfork Is.

Achyranthes aspera L., Sp. Pl. ed. 1, **1**: 204 (1753)–Fl. Brit. Ind. **4**: 730 (1885) –Fl. Males. **4**: 88 (1949).

var. **indica** L., l.c. 204 (1753)–Cavaco in Bol. Soc. Broter. **32**: 309 (1958).

A. obtusifolia Lamarck, Encycl. Méth. **1**: 545 (1783).

Biratnagar, 200 m (Oct. 14 & Dec. 20, 1963, fl.); Tharpu–Chyangthaphu (Nov. 26, 1963, fl.); Ghorwa–Sanichare, 300–200 m (Dec. 10, 1963, fl.).

Distr. sp. Pantropic.

Achyranthes bidentata Blume, Bijdr. 545 (1825)–Fl. Brit. Ind. **4**: 730 (1885)–Fl. Males. **4**: 88 (1949)–Kitamura, Faun. & Fl. Nepal Himal. 121 (1955)–Cavaco, l.c. 318 (1958).

Batasi, 2000 m (May 2, 1960, fr.); Kathmandu, 1400 m (Sep. 20, 21 & Oct. 9, 1963); Sanguri Bhanjang, 1200 m (Oct. 16, 1963, fl.); Sinduwa, 2100 m (Oct. 24, 1963, fr.); Taplejung–Garhi Danra, 1900–2200 m (Nov. 3, 1963, fr.); Ghari Danra–Tuwa, 2200–1800 m (Nov. 4, 1963, fr.); Yektin, 1400 m (Nov. 29, 1963, fr.); Yektin–Akasay, 1400–2300 m (Nov. 30, 1963, fr.); Dhara Pani–Illam, 1500–1200 m (Dec. 5, 1963, fl., fr.); Darjeeling, 2100–2200 m (Dec. 26, 1963 & Sep. 21 & 22, 1964, fl., fr.).

Distr. Tropical Africa, Himalaya (Kashmir to Sikkim), India south to Ceylon, east to China, and Malaysia south to New Guinea.

As regards the relationship between the Himalayan and Japanese plants, see page 635.

Achyranthes porphyristachya Wallich [Cat. no. 6925 (1829), nom. nud.] ex Moquin in DC., Prodr. **13** (2): 316 (1849).

A. aspera var. *porphyristachya* (Wall.) Hook. f. in Fl. Brit. Ind. **4**: 730 (1885)–Cavaco, l.c. 315 (1958).

Sanguri Bhanjang, 900–1200 m (Oct. 16, 1963, fl.).

Distr. Africa (introd.?), E. Himalaya (Nepal, Sikkim), India, N. Burma, and

China.

Aerva sanguinolenta (L.) Blume, Bijdr. 547 (1825)–Fl. Males. **4**: 85 (1949).

Achyranthes sanguinolenta L., Sp. Pl. ed. 2, 294 (1762).

Aerva scandens (Roxb.) Wallich, Cat. no. 6911 (1829)–Fl. Brit. Ind. **4**: 727 (1885).

Tista, 350 m (Apr. 26, 1960, fl.).

Distr. Himalaya (Kumaon to Bhutan), India, Indo-China, China, Formosa, and Malaysia.

Alternanthera sessilis (L.) DC. in Cat. Hort. Monspel. 77 (1813).

Gomphrena sessilis L., Sp. Pl. ed. 1, **1**: 225 (1753).

A. sessilis (L.) R. Brown ex Roem. et Schult., Syst. Veg. **5**: 554 (1819)–Fl. Brit. Ind. **4**: 731 (1885).

Rayang, 210 m (Apr. 21, 1960, no. 1847, fr.); Kathmandu, 1300 m (Oct. 13, 1963); Biratnagar, 200 m (Oct. 15, 1963, fr.); Nissim–Dumham, 1000 m (Oct. 30, 1963, fr.); Khebang–Bharomdin, 1700–1000 m (Nov. 24, 1963, fr.); Gauriganja–Rangali, 200 m (Dec. 13, 1963).

Distr. Tropical Old World.

Amaranthus caudatus L., Sp. Pl. ed. 1, **2**: 990 (1753)–Fl. Brit. Ind. **4**: 719 (1885).

Dhankuta, 1200 m (Oct. 19, 1963, fr.).

Distr. Widely cultivated; native country uncertain.

Amaranthus lividus L., Sp. Pl. ed. 1, **2**: 990 (1753)–Fernandes in Bol. Soc. Broter. ser. 2, **31**: 193 (1957).

A. Blitum L., l.c. 900 (1753)–Fl. Brit. Ind. **4**: 721 (1885).

Kathmandu, 1300 m (Oct. 13, 1963, fl.).

Distr. Worldwide in tropical & temperate regions.

Amaranthus spinosus L., Sp. Pl. ed. 1, **2**: 991 (1753)–Fl. Brit. Ind. **4**: 718 (1885).

Dhankuta, 1200 m (Oct. 19, 1963, fr.).

Distr. Pantropic, widely naturalized.

Celosia argentea L., Sp. Pl. ed. 1, **1**: 205 (1753)–Fl. Brit. Ind. **4**: 714 (1885).

Ranga Pani–Ghorwa, 700–300 m (Dec. 9, 1963, fr.); Sanichare–Sibganja, 200 m (Dec. 11, 1963, fr.).

Distr. Tropical Africa; widely naturalized.

Cyathula capitata Moquin in DC., Prodr. **13** (2): 329 (1849)–Fl. Brit. Ind. **4**: 722 (1885).

Hilay–Murhay, 1800–2100 m (Oct. 23, 1963, fr.); Sinduwa, 2100 m (Oct. 23 & 24, 1963, fr.); Darjeeling, 2200 m (Sep. 22, 1964, fl.).

Distr. Himalaya (Kashmir to Sikkim), and Indo-China.

Cyathula prostrata (L.) Blume, Bijdr. 549 (1825)–Fl. Brit. Ind. **4**: 723 (1885)–Fl. Males. **4**: 82, 4. r (1949).

Achyranthes prostrata L., Sp. Pl. ed. 2, 296 (1762).

Sunderijal, Kathmandu, 1600 m (Sep. 20, 1963); Phusri–Sanguri Bhanjang, 450–1200 m (Oct. 16, 1963, fl.); Mul Pokhari–Dumhan, 2500–700 m (Oct. 30, 1963, fl.); Khebang–Bharomdin, 1700–1000 m (Nov. 24, 1963, fl.); Illam–Ranga Pani, 1200–700 m (Dec. 8, 1963, fr.); Namli, Gangtok, 900 m (Sep. 12, 1964, fl.).

Distr. Africa, Himalaya, India, Burma, east to S. China and Formosa, Malaysia, Australia, and Oceania.

Cyathula tomentosa (Roth) Moquin in DC., Prodr. **13** (2): 327 (1849)–Fl. Brit. Ind. **4**: 722 (1885).

Achyranthes tomentosa Roth, Nov. Sp. Ind. 167 (1821).

Dentam, 1500 m (May 12, 1960, no. 213, fr.); Dhara Pani–Dhankuta, 300–1200 m (Oct. 17, 1963, fl.); Mul Pokhari–Dumhan, 2500–700 m (Oct. 30, 1930, fl.); Bhandukay–Ghatte, 2500–1600 m (Nov. 16, 1963, fr.); Ghatte, 1600 m (Nov. 17, 1963, fr.).

Distr. Himalaya (Kashmir to Bhutan), Khasia, Manipur, and W. China.

Deeringia amaranthoides (Lam.) Merrill, Interpr. Rumph. Herb. Amb. 211 (1917)–Suessenguth in Fedde, Rep. **44**: 38 (1938)–Fl. Males. **4**: 71 (1949).

Achyranthes amaranthoides Lamarck, Encycl. Méth.**1**: 548 (1785).

Celosia baccata Retzius, Obs. Bot. **5**: 23 (1789).

Deeringia celosioides R. Brown, Prodr. Fl. Nov. Holl. 413 (1810)–Fl. Brit. Ind. **4**: 714 (1885).

Biratnagar 200 m (Oct. 14, 1963, bud); Sanguri Bhanjang, 1200 m (Oct. 16, 1963, fl.); Garhi Danra–Tuwa, 2200–1800 m (Nov. 4, 1963, fl.); Helok–Iladanda, 1500–1800 m (Nov. 8 & 13, 1963, fl.); Ghatte, 1600m (Nov. 17, 1963, defl.); near Khebang, 1700 m (Nov. 22, 1963, fr.); Loohya Mai–Ghorwa, 400–300 m (Dec. 9, 1963, fr.).

Distr. Himalaya (Simla to NEFA), India, N. Burma, Indo-China, W. & S. China, Formosa, Malaysia, and Australia.

Iresine Herbstii Hook. f. in Gard. Chron. **1864**: 654 & 1206 (1864); in Bot. Mag. t. 5499 (1865)–Fl. Males. **4**: 97 (1949).

Dhara Pani–Illam, cult., 1500–1200 m (Dec. 5, 1963, fl.).

Distr. Brazil.

NYCTAGINACEAE (by Hiroshi Hara)

Boerhavia diffusa L., Sp. Pl. ed. 1, **1**: 3 (1753)–Stemmerik in Fl. Males. **6**: 454 (1964).

B. repens L., l.c. 3 (1753)–Fl. Brit. Ind. **4**: 709 (1885).

Gangtok, 1600 m (Jun. 13, 1960, fl.); Dhara Pani–Tamur Bridge, 300 m (Oct. 17, 1963, fl.); Dumhan, 700 m (Oct. 31, 1963, fl.).

Distr. Widely distributed in tropical & subtropical regions of the Old World.

PHYTOLACCACEAE (by Hiroshi Hara)

Phytolacca acinosa Roxburgh, Fl. Ind. ed. 2, **2**: 458 (1832)–Fl. Brit. Ind. **5**: 21 (1890), p.p.–H. Walter in Pfl.-reich IV–83, Ht. **39**: 41 (1909)–Loesener in Beih. Bot. Centr. **37** (2): 117 (1919)–Hand.-Mzt., Symb. Sin. **7**: 163 (1929), p.p.

Pircunia Latbenia Moq. in DC., Prodr. **13** (2): 29 (1849).

Phytolacca Latbenia (Ham.) H. Walter in Engl., Bot. Jahrb. **37**, Beibl. **85**: 12 (1906); l.c. 41 (1909).

Yoksam, near the monastry, 1780 m (May 17, 1960, fl.); near Dentam, 1500m (May 11, 1960).

Distr. Himalaya (Kashmir to Bhutan), Assam, and W. China (Szechuan, Yunnan).

So far as the Sikkim specimens I have examined are concerned, they have 6–8 carpels and 12–16 stamens, and can be referred to *P. Latbenia* (Moq.) H. Walter described from Nepal. In the original description of *P. acinosa* from Nepal, the number of carpels is given as 6–8, and that of stamens as 10. I think that *P. Latbenia* is identical with *P. acinosa*, as suggested already by Hance in 1869.

As compared with typical *P. acinosa* from Himalaya, the Japanese plants (*P. esculenta* Van Houtte) have roundish leaves less pointed at the apex, almost smooth pedicels, rose anthers, shorter styles, and generally 8 carpels and 8 stamens. Some intermediate forms, however, seem to occur in Formosa and China.

The another species with connate berries was collected below Taplejung of East Nepal, and it appears to be *P. americana* L.

AIZOACEAE (by Hiroshi Hara)

Mollugo pentaphylla L., Sp. Pl. ed. 1, **1**: 89 (1753)–Fl. Males. **4**: 268 (1951).

M. stricta L., Sp. Pl. ed. 2, 131 (1762)–Fl. Brit. Ind. **2**: 663 (1879).

M. pentaphylla var. *stricta* (L.) Hochr. in Candollea **2**: 356 (1925).

Phusri–Dhara Pani, 450–1000 m (Oct. 16, 1963, fl., fr.).

Distr. India, east to China and Japan, Malaysia, Melanesia, and Australia.

PORTULACACEAE (by Hiroshi Hara)

Portulaca oleracea L., Sp. Pl. ed. 1, **1**: 445 (1753)–Fl. Brit. Ind. **1**: 246 (1874)–Poellnitz in Fedde, Rep. **37**: 258 (1934), subsp. *silvestris* Thellung.

Swayambhu Nath, Kathmandu, 1500 m (Sept. 23, 1963, fr.); Dhankuta, 1200 m (Oct. 19, 1963, fr.).

Distr. Temperate and tropical regions of the Old World.

BASELLACEAE (by Hiroshi Hara)

Basella alba L., Sp. Pl. ed. 1, **1**: 272 (1753)–Fl. Males. **5**: 300, f. 1 (1957).

B. rubra L., l.c. 272 (1753)–Fl. Brit. Ind. **5**: 20 (1886).

Biratnagar, 200 m (Oct. 15, 1963, fl.).

Distr. Probably native to tropical Africa and S. Asia.

CARYOPHYLLACEAE (by Masami Mizushima)

Brachystemma calycinum D. Don, Prodr. Fl. Nepal. 216 (1825)–Edgeworth et Hook. f. in Fl. Brit. Ind. **1**: 235 (1874).

Arenaria nepalensis Sprengel, Syst. Veg. Cur. Post. 181 (1827)–Williams in Journ. Linn. Soc. **33**: 429 (1898), cum *α. himalaica* et *β. khasiana* Williams.

Tingling Bridge–Yoksam, 1000–1700 m (May 16, 1960).

Distr. E. Himalaya (Nepal to Bhutan), Assam, and W. China (Yunnan and Szechuan).

Cerastium glomeratum Thuillier, Fl. Envir. Paris ed. 2, 226 (1799)–Schischkin in Fl. URSS. **6**: 450 (1936)–Lonsing in Fedde, Rep. **46**: 162 (1939).

C. vulgatum L. var. 1. *glomerata* (Thuill.) Edgew. et Hook. f. in Fl. Brit. Ind. **1**: 228 (1874).

Darjeeling, 2100 m (Apr. 1, 1960).

Distr. Cosmopolitan.

Cerastium holosteoides Fries, Nov. Fl. Suec. **4**: 52 (1817).

subsp. **triviale** (Link) Möschl in Bot. Not. **1948**: 375 (1948)–Mizushima in Sci. Rep. Tohoku Univ. ser. 4 Biol. **29** (3–4): 281 (1963).

var. **hallaisanense** (Nakai) Mizushima in Journ. Jap. Bot. **38**: 149 (1963).

Darjeeling, 2100 m (Apr. 1, 1960) ; Palmajua–Rimbick (May 5, 1960); Rimbick, 2200 m (May 5, 1960), Penlong La, Gangtok, 2100 m (Jun. 15, 1960); Murhay-Bilbatay Bhanjang, 2100–2200 m (Oct. 24, 1963, fl. & fr.); near Chyangthaphu–Birwa, 1300–2400 m (Nov. 27, 1963, fr. & fl.).

Distr. Himalaya (Nepal eastwards), China, Formosa, Korea, Japan, and Bonins.

Our specimens appear to be annual or very short-lived perennial which may be termed " winter-annual," and bracts are never scarious-margined. The specimens from the warm-temperate regions of eastern Asia always show this feature, therefore the plants there are treated as a geographical race of the Euro-Siberian plants with scarious-margined bracts and perennial habit.

Dianthus chinensis L., Sp. Pl. ed. 1, **1** : 411 (1753)–Schischkin in Fl. URSS. **6**: 823 (1936)–How et al., Fl. Canton 129 (1956).

Ghatte, 1300 m (Nov. 17, 1963, fl.) ; Tharpu, 1200 m (Nov. 26, 1963, fl.), perhaps an escape.

Distr. China, commonly cultivated in India (acc. Hook. f.) and also in Japan.

Drymaria diandra Blume, Bijdr. 62 (1825)–Mizushima in Journ. Jap. Bot. **32**: 79, fig. A (1957)–Rolla in Bull. Bot. Surv. Ind. **5**: 176 (1963).

D. cordata Willd. sensu Edgeworth et Hook. f. in Fl. Brit. Ind. **1**: 244 (1874), excl. syn. *Cerastium cordifolium* Roxb. quae fortasse *Stellaria aquatica* Scop.

D. cordata subsp. *diandra* (Bl.) Duke in Ann. Miss. Bot. Gard. **48**: 253, fig. 18, D–E (1961).

Rayang, 250 m (Apr. 20, 1960); Yoksam, 1800 m (May 17, 1960, no. 611); Kathmandu Airport, 1400 m (Oct. 13, 1963, fl.); Dhankuta, 1200 m (Oct. 19, 1963, fl.); Tharpu, 1200 m (Nov. 26, 1963, fl.).

Distr. Tropical and subtropical Asia (India eastwards to Ryukyu), Formosa, W. & S. China, Philippines, and New Guinea, n.-e. Australia, tropical Africa, Oceania, and Hawaii.

Reduction of *D. diandra* to a subspecies of *D. cordata* (Duke, l.c. 253, fig. 18-A-E, 1961) seems to need a more meticulous re-examination based on a more ample amount of material from Malaysia, Australia, and especially from Africa. It must be done morphologically along with a cytotaxonomic approach. Intermediates found in the African plants are supposed to be partly a hybrid origin. A specific status of this Indo-Malaysian plant can be justifiable until the coming of a more complete solution. At last one more key character can be added to tell both the entities, i.e. the stigmatic surface of expanded flowers has shorter papillae in *D. diandra* than those of *D. cordata.*

Drymaria villosa Chamisso et Schlechtendal in Linnaea **5**: 232 (1830).

subsp. **villosa**: Duke in Ann. Miss. Bot. Gard. **48**: 226, fig. 11, D-E (1961)–Mizushima in Journ. Jap. Bot. **38**: 150 (1963).

Darjeeling, 2100 m (Apr. 1, 1960); Happy Valley, 2000 m (Apr. 10, 1960); Kurseong, 1500 m (Apr. 12, 1960), mixed with *Stellaria patens* and *S. Alsine* var. *undulata*; Takdah, 1600 m (Apr. 18, 1960, no. 1975); Rayang, 250 m (Apr. 20, 1960); Siliguri–Kurseong (Apr. 29, 1960) ; Mani Bhanjang–Batasi, 2000 m (May 1, 1960, no. 5);

Gangtok, 1600 m (Jun. 13, 1960); Phusri–Sanguri Bhanjang–Dhara Pani (Oct. 16, 1963); Dhankuta–Sinduwa, 1200–2100 m (Oct. 22, 1963, fl. & fr.); Khebang–Bharomdin, 1700–1000 m (Nov. 24, 1963, fl. & fr.); Tharpu, 1200 m (Nov. 26, 1963, fl. & fr.); Mai Majuwa–Dhara Pani, 1500–1900 m (Dec. 4, 1963, fl. & fr.).

Distr. C. America southwards along the Pacific coast of S. America to Peru; introduced widely in Malaysia and India.

Lychnis apetala L., Sp. Pl. ed. 1, **1**: 437 (1753), sensu lato–Edgeworth et Hook, f. in Fl. Brit. Ind. **1**: 222 (1874).

Melandrium apetalum (L.) Fenzl in Ledeb., Fl. Ross. **1**: 326 (1842)–Schischkin in Fl. URSS. **6**: 716, t. 44, fig. 2 (1936).

Jongri, 4100 m (May 23, 1960).

Distr. Arctic-alpine regions of Eurasia, and N. America.

Since the specimen comprises old stems and capsules without mature seeds, it is uncertain that the plant belongs to which of the two entities, *L. apetala* with winged seeds or *L. macrorhiza* Royle with seeds not winged but merely concentrically granulate.

Lychnis cf. **himalayensis** (Rohrb.) Edgeworth in Fl. Brit. Ind. **1**: 223 (1874)–Mizushima in Faun. & Fl. Nepal Himal. 123 (1955).

Jongri, 4000 m (May 23, 1960).

Distr. Himalaya (Sikkim, Nepal & Sassar), and W. Tibet.

The specimen consists of a very old-stemmed individual with broken capsules containing immature seeds, therefore correct identification is difficult.

Polycarpon indicum (Retz.) Merrill in Philip. Journ. Sci. **10**: 302 (1915)–How et al., Fl. Canton 128 (1956)–Mizushima in Journ. Jap. Bot. **38**: 151 (1963).

Rayang, 250 m (Apr. 20, 1960).

Distr. Throughout the hotter parts of India, tropical Asia, and perhaps Africa.

Pseudostellaria cashmiriana Schäftlein in Phyton **7**: 195 (1957)–Mizushima in Journ. Jap. Bot. **38**: 151 (1963).

Phalut, 3000–3500 m (Jun. 5, 1960, no. 666); Phalut–Sandakphu, 3500 m (Jun. 6, 1960, no. 672).

Distr. Afghanistan, and Himalaya (Kashmir & Sikkim).

Sagina japonica (Sw.) Ohwi in Journ. Jap. Bot. **13**: 438 (1937), excl. syn. *S. maxima* A. Gray–Mizushima in Journ. Jap. Bot. **35**: 257 (1960); **38**: 152 (1963).

Darjeeling, 2100 m (Apr. 1, 1960); Senchal–Takdah, 1700–2400 m (Apr. 17, 1960); Kalimpong, 1300 m (Apr. 23, 1960); Gangtok, 1650 m (Apr. 26, 1960); Palmajua, 2300 m (May 4, 1960); Palmajua–Rimbick (May 5, 1960); Chia Bhanjang–Dentam (May 11, 1960); Pamianchi–Tingling Bridge, 1000–2000 m (May 15, 1960); Penlong La, Gangtok, 2000 m (Jun. 16, 1960); Selap–Walunchung Gola (Nov. 10, 1963, fr.); Helok–Baroya Khimty, 1500–2500 m (Nov. 15, 1963, fr. & fl.); Bhuspate Danra, 2600 m (Dec. 2, 1963, fr.); Illam, 1200 m (Dec. 6, 1963, fr.).

Distr. E. Himalaya (Nepal, Sikkim, e. Assam), S. Kuriles, S. Saghalin, Ussuri, Korea, China, E. Tibet, Formosa, Japan, and Bonins.

Sagina procumbens L., Sp. Pl. ed. 1, **1**: 128 (1753), excl. varr.–Steinberg in Fl. URSS. **6**: 474 (1936)–Mizushima in Journ. Jap. Bot. **38**: 152 (1963).

Darjeeling, 2100 m (Apr. 1, 1960).

Distr. Subcosmopolitan.

Stellaria Alsine Grimm in Nov. Act. Leopold. **3**, App. 313 (1767).

var. **undulata** (Thunb.) Ohwi in Act. Phytotax. Geobot. **10**: 136 (1941)-Mizushima in Journ. Jap. Bot. **40**: 250 (1965).

S. uliginosa Murr. sensu Edgew. et Hook. f. in Fl. Brit. Ind. **1**: 233 (1874).

Kurseong, 1500 m (Apr. 12 & 29, 1960); Rayang, 250 m (Apr. 20, 1960); Palmajua-Rimbick (May 5, 1960); Nayathang-Chia Bhanjang, 3300-3100 m (Jun. 2, 1960); Taplejung, 1700 m (Nov. 2, 1963, fl. & young fr.); Taplethok-Helok, 1400-1500 m (Nov. 6, 1963, fr. & fl.); Bharomdin-Tharpu, 700-1200 m (Nov. 25, 1963, fr.).

Distr. var. Himalaya (E. Nepal eastwards), also temperate regions of E. Asia, Indo-China (?) and Java (?).

These specimens appear to be aberrant under unsuitable conditions. The inflorescence is condensed terminally or in the axils of leaves, and the flowers are apetalous or nearly so. Although the latter character superficially keys them to var. *Alsine*, the eastern parts of Nepal and Sikkim are in the range of distribution of var. *undulata*. Therefore these specimens are preferably referred to the eastern Asiatic variety.

Stellaria aquatica (L.) Scopoli, Fl. Carniol. ed. 2, **1**: 319 (1772)-Edgeworth et Hook. f. in Fl. Brit. Ind. **1**: 229 (1874)-Mizushima in Journ. Jap. Bot. **40**: 255 (1965).

? *Cerastium cordifolium* Roxburgh, Fl. Ind. **2**: 458 (1832), sec. J. R. Sealy in litt.

Kathmandu Airport, 1400 m (Oct. 13, 1963, fr. & fl.).

Distr. Temperate regions of Eurasia; introduced. in N. America.

Stellaria decumbens Edgeworth in Trans. Linn. Soc. **20**: 35 (1846); in Fl. Brit. Ind. **1**: 234 (1874), cum varr.

S. cherleriae (Fisch.) Williams in Bull. Herb. Boiss. ser. 2, **7**: 830 (1907), p.p. et quoad pl. Ind. bor.

Phalut-Chia Bhanjang, 3300 m (May 11, 1960); Jongri-Base Camp (May 20, 1960); Jongri (May 23, 1960); Jongri-Olothang, 4000-4300 m (May 23, 1960); Gamothang, 3700 m (May 29, 1960); Migothang, 4200 m (May 31, 1960); Nayathang-Chia Bhanjang, 3300-3100 m (Jun. 2, 1960).

Distr. Himalaya (Kashmir to Sikkim), W. Tibet, W. China (n.-w. Yunnan).

As already pointed out by Edgeworth and Hook. f. or Handel-Mazzetti (Symb. Sin. **7**: 192, 1929), *S. cherleriae* and *S. petraea* Bunge are closely allied to *S. decumbens*. The separation of these entities here accepted is provisional, and a close revision based on an ample material from north India to east Siberia is strongly needed. In this concern, Kung & Wang's report of *S. decumbens* from Hsiao-wutai-shan (about 40°N & 115°E in Hopei prov., n. China) is interesting (cf. Contr. Inst. Bot. Nat. Acad. Peiping **2**: 289, 1934).

Stellaria lanata Hooker f. in Fl. Brit. Ind. **1**: 232 (1874).

Nayathang-Chia Bhanjang, 3300-3100 m (Jun. 2, 1960); Chia Bhanjang-Phalut, 3100- 3500 m (Jun. 2, 1960, no. 632); Phalut, 3500 m (Jun. 5, 1960).

Distr. Sikkim.

Stellaria media (L.) Villars, Hist. Pl. Dauph. **3**: 615 (1789).

var. **media**: Edgeworth et Hook. f., l.c. (1874), p.p.-Schischkin in Fl. URSS. **6**: 395, t. 20, fig. 2 (1936)-Mizushima, l.c. 94 (1965).

S. modesta Fenzl ex Zollinger, Syst. Verz. Ind. Archip. **2**: 142 (1854), nom. nud.; in Nat. Tijdschr. Nederl. Ind. **14**: 165 (1857)-Hara in Journ. Jap. Bot. **30**: 198 (1955).

Darjeeling, 2100 m (Apr. 1, 1960).

Distr. Cosmopolitan.

var. **procera** Klett et Richter, Fl. Leipz. 382 (1830)-Mizushima in Journ. Jap. Bot. **40**: 95 (1965).

S. media L. sensu Edgew. et Hook. f. in Fl. Brit. Ind. **1**: 230 (1874), p.p. et excl. syn. *Alsinella Wallichiana* Benth. quae *Stellaria Wallichiana* (Benth.) Haines.

Darjeeling, 2100 m (Apr. 1, 1960); Dhankuta, 1200 m (Oct. 20, 1963, fr.); Illam, 1200 m (Dec. 6, 1963, fl. & fr.).

Distr. var. Eurasia, N. Africa, and N. America (natural.).

Stellaria monosperma Hamilton ex D. Don, Prodr. Fl. Nepal. 215 (1825).

var. **monosperma** f. **paniculata** (Edgew.) Mizushima in Journ. Jap. Bot. **32**: 248, fig. 1–P (1957).

S. paniculata Edgew. in Trans. Linn. Soc. **20**: 35 (1846); in Fl. Brit. Ind. **1**: 229 (1874).

Bilbatay Bhanjang, 2200 m (Oct. 26, 1963, fl. & young fr.); Hati Sar–Minchin Dhap, 2800–2900 m (Oct. 28, 1963); Mul Pokhari–Gorzu Kosir (Oct. 30, 1963, fl.); Birwa–Yektin, 1600–2900 m (Nov. 28, 1963).

Distr. f. N. E. Afghanistan, Temperate Himalaya (Kashmir to Sikkim), N. W. Assam, w. Madras, and Indo-China.

f. **scabrifolia** Mizushima, l.c. 249, fig. 1–S (1957).

? *S. Delavayi* Franch., Pl. Delav. 97 (1889).

Add. descr. Sepals 4 mm long; petals 2/3 the length of sepals, about 1/3 bilobed, evidently clawed; stamens 5, alternisepalous, with glabrous filaments about as long as petals; discs hypogynous, nearly 5-lobed; styles 3, stigmatose about 2/3 of their length; ovaries unilocular with 3 ovules at the base of columella; capsules globose, shorter than sepals, 1-seeded; seeds reniform-globular, 2.8 mm across feebly tubercled (practically called smooth) just before maturity.—Capsules appear to dehisce in 6 teeth halfway down when pressed.

Bilbatay Bhanjang, 2200 m (Oct. 26, 1963, fl. & fr.).

Distr. f. E. Nepal, and S.-W. China (Yunnan).

This is a new record for India.

Stellaria ovatifolia (Mizush.) Mizushima in Journ. Jap. Bot.. **41**: 259 (1966.)

Brachystemma ovatifolium Mizushima in Act. Phytotax. Geobot. **16**: 42 (1955).

Add. descr. Leaves lanceolate 50–68 mm long 11–15 mm wide and more or less 4 : 1, pubescent on the upper surface, margins, and on the midrib beneath with multicellular, uniseriate or dendroid, rather stiff hairs especially when young. Capsules globular shorter than sepals and 2.5 mm in diameter, 4- or 6-valved when pressed, 1-seeded; seeds reniform-globular densely papillose.—The papillose cells of the seed-coat are multiradiate characterizing the genus *Stellaria* and its allies.

Iladanda–Selap, 1800–2600 m (Nov. 9, 1963, fr. & fl.); Selap–Zongi (Nov. 10, 1963, fl.); Batasay, 2400 m (Nov. 30, 1963).

Distr. Nepal.

This plant is mistakably alike to *Brachystemma calycinum* D. Don in general appearance, therefore I ascribed it to the genus at the time of publication in 1955. A question was left opened to later confirmation, since the petals were 2-parted (of *Stellaria* spp.) and there were no seeds. As described above, the cells of seedcoat clearly belong in shape to those of the species of *Stellaria*, while those in the species of *Arenaria* and its allied genera, in which the genus *Brachystemma* falls, are oblong or if any slightly waved in outline. Besed on these characters, a new combination of the name becomes necessary as above. The resultant new name *Stellaria ovatifolia* does not represent the same plant as *S. ovalifolia* Hook., Fl. Bor. Amer. **1**: 97 (1833), nor the specific epithets of both the entities are orthographic variants. Therefore the new name can not be considered as a later homonym of Hooker's.

Stellaria patens D. Don, Prodr. Fl. Nepal. 215 (1825)–Mizushima in Faun. & Fl. Nepal. Himal. 124 (1955).

S. Fenzliana Klotzsch in Klotzsch u. Garcke, Bot. Ergebn. Reis. Pr. Waldemar 141, t. 29–A (1862).

S. mollis Klotzsch, l.c. 142, t. 29-B (1862); non Willdenow ex Schlechtendal 1816.

S. longissima Wallich ex Edgew. et Hook. f. in Fl. Brit. Ind. **1**: 232 (1874).

Kurseong, 1500 m (Apr. 12, 1960); Gangtok, 1650 m (Apr. 26, 1960; Jun. 15, & 16, 1960); Penlong La, 2000 m (Jun. 16, 1960); Palmajua–Rimbick, 1500–2200 m (May 5, 1960); Ghum, 2300 m (Jun. 9, 1960).

Distr. Himalaya (Punjab to Sikkim).

Stellaria reticulivena Hayata, Icon. Pl. Formos. **7**: 1, fig. 1 (1918)–Mizushima in Journ. Jap. Bot. **38**: 153 (1963).

Batasi–Palmajua, 2300–2600 m (May 3, 1960, no. 74); Chia Bhanjang–Dentam (May 11, 1960); Yoksam–Bakkim, 1700–2200 m (May 18, 1960).

Distr. Sikkim, and Formosa (subalpine).

The discovery of this Formosan species in Sikkim suggests its occurrence in S. W. China.

Stellaria sikkimensis Hooker f. in Fl. Brit. Ind. **1**: 230 (1874).

Chia Bhanjang–Dentam (May 11, 1960); Nayathang–Chia Bhanjang, 3300–3100 m (Jun. 2, 1960); Chia Bhanjang–Phalut, 3100–3500 m (Jun. 2, 1960); Garibans–Tonglu, 2800–3000 m (Jun. 7, 1960); Penlong La, 2000 m (Jun. 16, 1960); Chitray, 2100 m (Oct. 24, 1963, fr.); Bilbatay Bhanjang, 2200 m (Oct. 26, 1963, fr.); Bilbatay Bhanjang–Hati Sar (Oct. 27, 1963, fr. & fl.); Minchin Dhap–Mul Pokhari 2900–2500 m (Oct. 29, 1963, fl. & fr.); Selap–Walunchung Gola, 2600–3800 m (Nov. 10, 1963, fr. & fl.); Thakma Khola–Diorali Bhanjang, 3200–3500 m (Nov. 14, 1963, fr.).

Distr. E. Himalaya (Nepal and Sikkim).

Though J. D. Hooker attributed the affinity of the plant to *S. saxatilis* (=*S. vestita* Kurz), there is no difficulty to distinguish them because of their very different hairs.

The degree of hairiness in leaves varies from pubescent on both surfaces to glabrous above. The petioles are 1–2 (–3) mm long and are (1/6–) 1/10–1/20 as long as the blades, but in the basal leaves, they elongate to a half as long as the blades or sometimes more. The presence of a short petiole stands near to the subsect.

Petiolares of the sect. Eustellaria of Pax & Hoffmann, but the flowers more or less perigynous suggest the position in the subsect. Larbrea. Since these characters vary independently, as other characters, in the genus *Stellaria*, infrageneric categories hitherto accepted seem to need a closer revision.

Stellaria vestita Kurz in Journ. Bot. **11**: 194 (1873)–Mizushima in Journ. Jap. Bot. **38**: 153 (1963).

S. saxatilis Hamilt. ex D. Don, Prodr. Fl. Nepal. 215 (1825)–Fl. Brit. Ind. **1**: 232 (1874).

Kurseong, 1500 m (Apr. 12, 1960); Sinduwa, Dhankuta Distr., 2200 m (Oct. 23, 1963).

Distr. Temperate Himalaya (Nepal to Bhutan), Assam, W. Madras, Indo-China, W. & C. China (Yunnan, Szechuan, Hupeh), Formosa, and Malaysia.

NYMPHAEACEAE (by Hiroshi Hara)

Nymphaea stellata Willd., Sp. Pl. **2** (2): 153 (1800).

var. **versicolor** (Sims) Hook. f. et Thoms., Fl. Ind. **1**: 243 (1855)–Fl. Brit. Ind. **1**: 114 (1872).

N. versicolor Sims in Bot. Mag. t. 1189 (1809).

Sibganja–Mahara Bahara, 200 m (Dec. 12, 1963, fl.).

Distr. India, south to Malaysia, and Africa.

TETRACENTRACEAE (by Hiroshi Hara)

Tetracentron sinense Oliver in Hooker, Icon. Pl. **19**: t. 1892 (1889)–A. C. Smith in Journ. Arn. Arb. **26**: 137 (1945)–I. W. Bailey et Nast in Journ. Arn. Arb. **26**: 143 & 267, figs. (1945).

var. **himalense** Hara et Kanai in Journ. Jap. Bot. **39**: 194 (1964). [Pl. 19, 20]

Bandukay Bhanjang, 3100 m (Dec. 3, 1963—Typus, a large fruiting tree more than 1 m in diam.); Thakma Khola–Diorali Bhanjang, 3200 m (Nov. 14, 1963, ster.).

Dist. sp. E. Nepal, N. E. Assam, S. Tibet, N. Burma, and W. & C. China (Yunnan, Szechuan, S. Kansu, Kweichow, Shensi, Hupeh).

The genus is new to Eastern Himalaya, and is one of the most remarkable findings during our second botanical trip (Fig. 13). It is highly probable that the

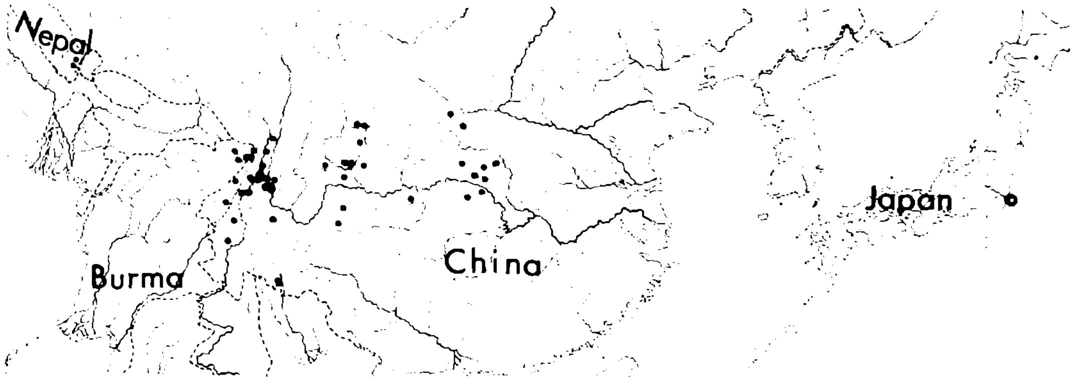

Fig. 13. Distribution map of *Tetracentron sinense*.
○ denotes *Tetracentronites japonica* discovered from the Cretaceous of Japan.

plant will be found in Sikkim or Bhutan in future. The figure 36 of *Betula alnoides* from NEFA published in Rec. Bot. Surv. India **17** (2) (1959) looks like a young branch of *Tetracentron.*

The typical form of *Tetracentron sinense* from Hupeh, Shensi, and Kweichow has smaller leaves with shorter acuminate tip and obtuse teeth, and denser inflorescences. The Himalayan plants have generally larger leaves with longer caudate-acuminate tip and minute pointed teeth, and looser infructescences. The specimens from N. Burma and some from Yunnan almost agree with those from Himalaya, while some from Yunnan and Szechuan show intermediate characters between the typical form and the variety in the shape and serration of leaves.

The anatomical characters of the wood were studied by Prof. Shunji Watari and Miss Fumi Yamanouchi.1) (Plate 20)

RANUNCULACEAE (by Hiroshi Hara)

Aconitum Bisma (Hamilt.) Rapaics in Növ. Közl. **6**: 164 (1907)–Hand.-Mzt. in Act. Hort. Gothob. **13**: 104 (1939).

Caltha Bisma Hamilton in Edinb. Journ. Sci. **1**: 251 (1824).

Aconitum palmatum D. Don, Prodr. Fl. Nepal. 196 (1825)–Stapf in Ann. Bot. Gard. Calcut. **10**: 156, t. 102 (1905)–Chakravarty, H. L. et D. in Econ. Bot. **8**: 370, fig. (1954).

Gatribas, 2800 m (Sep. 16, 1964, fr.); Tonglu, 3000 m (Sep. 17, 1964, fr.).

Distr. E. Himalaya (Nepal, Sikkim, NEFA), S. Tibet, and W. China?

Aconitum Elwesii Stapf in Ann. Bot. Gard. Calcut. **10**: 174, t. 112 A (1905).

A. uncinatum L. sensu Fl. Brit. Ind. **1**: 28 (1872).

Thakma Khola, 3000 m (Nov. 12, 1963, fr.).

Distr. E. Himalaya (E. Nepal, Sikkim).

Aconitum ferox Wallich ex Seringe, Mus. Helv. **1**: 160, t. 15, f. 43, 44 (1823)–Stapf, l.c. 169, t. 109 (1905)–Munz in Gent. Herb. **6**: 496 (1945)–Chakravarty, l.c. 373, fig. (1954).

Bilbatay Bhanjang, 2200 m (Oct. 25, 1963, fl.).

Distr. E. Himalaya (Nepal, Bhutan).

Aconitum laciniatum Stapf in Ann. Bot. Gard. Calcut. **10**: 168, t. 108 (1905)–Chakravarty, l.c. 373 (1954).

Sandakphu, 3600 m (Sep. 16, 1964, fl.).

Distr. E. Himalaya (E. Nepal, Sikkim), and S. Tibet.

Aconitum spicatum Stapf in Ann. Bot. Gard. Calcut. **10**: 165, t. 106 & 107

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1) The specimen collected by the members of the expedition in 1963 is a branch wood about 45 cm long and 5 cm in diameter. It has at least fifty growth rings and this comparatively large number of rings partly owes the presence of some twenty extremely narrow increments chiefly produced in 1933–1947 and 1958–1960. The anatomical features of the wood of this specimen agree well with those of *Tetracentron sinensis* observed by Bailey and Nast (1945), who pointed out several interesting structures which do not occur in the wood of another vesselless dicot of Eastern Asia, *Trochodendron.* The most significant of these are the sporadical occurrence of abnormally short and profusely pitted tracheids and an abundance of paired parenchyma never known in any of other vascular plants. Although the observation of these authors was restricted to a comparatively young and slender stem with twelve growth rings, it was recognized in the present specimen that both of these particular features persist throughout more than fifty growth rings. (by Shunji Watari and Fumi Yamanouchi)

(1905)–Chakravarty, l.c. 373 (1954)–Lauener in Not. Bot. Gard. Edinb. **25**: 24 (1963). [Pl. 6 b]

A peak, east of Siling Tzokupa, 3300 m (Nov. 21, 1963, fr.); below Tonglu, 2800 m (Sep. 16, 1964, fl.); Sandakphu, 3600 m (Sep. 16, 1964, fl.).

Distr. E. Himalaya (Nepal to Bhutan), and S. Tibet.

Anemone demissa Hooker f. et Thomson, Fl. Ind. **1**: 23 (1855)–Fl. Brit. Ind. **1**: 9 (1872)–Brühl in Ann. Bot. Gard. Calcut. **5** (2): 81, t. 107 B (1896), incl. var. *villosissima* Brühl–Hand.-Mzt. in Act. Hort. Gothob. **13**: 180 (1939).

A. narcissifolia L. var. *demissa* (Hook. f. et Thoms.) Finet et Gagnep. in Bull. Soc. Bot. France **51**: 74 (1904).

Jongri, 4000 m (May 23–26, 1960, no. 450 & 494, fl.); Jongri–Gamothang, 4200–3600 m (May 26, 1960, no. 507, fl.); Gamothang–Migothang, 3800–4200 m (May 30, 1960, fl.); Migothang, 4200 m (May 31, 1960, fl.).

Distr. E. Himalaya (Nepal to Bhutan), S. Tibet, and W. China.

Anemone obtusiloba D. Don, Prodr. Fl. Nepal. 194 (1825)–Fl. Brit. Ind. **1**: 8 (1872)–Lauener in Not. Bot. Gard. Edinb. **23**: 181, figs. (1960), subsp. *obtusiloba* var. *obtusiloba*–Spring Fl. Sikkim Himal. f. 84 & 86 (1963).

Ramam–Phalut, 3500 m (May 9, 1960, fl.); Sandakphu, 3600 m (May 7, 1960, fl.); Bakkim–Jongri, 4000 m (May 19, 1960, fl.); Gamothang–Migothang, 3800–4200 m (May 30, 1960, fl.); Migothang–Nayathang, 3900–3300 m (Jun. 1, 1960, no. 730, fl.); Nayathang–Chia Bhanjang, 3300–3100 m (Jun. 2, 1960, fl.); Phalut, 3500m (Jun. 4 & 5, 1960, no. 651 & 659, fl.); Sandakphu–Garibans, 3600–2800 m (Jun. 7, 1960, fl.).

Distr. Himalaya (Kashmir to Bhutan), SE. Tibet, and N. Burma.

Anemone rivularis Hamilton ex DC., Syst. **1**: 211 (1818)–Fl. Brit. Ind. **1**: 9 (1872)–Hand.-Mzt., l.c. 176 (1939)–Spring Fl. Sikkim Himal. f. 165 (1963).

Darjeeling, 2100 m (Jun. 21, 1960, fl.).

Distr. Himalaya, south to Ceylon, and W. & N. China.

Anemone rupestris Wallich ex Hook. f. et Thomson, Fl. Ind. **1**: 21 (1855)–Fl. Brit. Ind. **1**: 9 (1872)–Lauener in Not. Bot. Gard. Edinb. **23**: 198 (1960), subsp. *rupestris*.

Migothang, 4200 m (May 30, 1960).

Distr. E. Himalaya (Nepal to Bhutan), S. Tibet, and W. China.

Anemone vitifolia Hamilton ex DC., Syst. **1**: 211 (1818)–Fl. Brit. Ind. **1**: 8 (1872)–Bowles & Stearn in Journ. Roy. Hort. Soc. **72**: 298 & 308, figs. (1947).

Helok–Iladanda, 1500–1800 m (Nov. 8, 1963, fr.); Helok, 1500 m (Nov. 10, 1963, fr.); Ghatte, 1300 m (Nov. 17, 1963); Batasay–Halhare Bhanjang, 2400–2700m (Dec. 1, 1963, fr.).

Distr. Himalaya (Kashmir to NEFA), N. Burma, and W. China (Yunnan).

Caltha Govaniana Wallich [Cat. no. 4710 (1831), nom. nud.] ex Royle, Ill. Bot. Himal. 54 (1834), e typo.

C. palustris L. sensu Fl. Brit. Ind. **1**: 21 (1872), p.p.

C. palustris var. *himalaica* Tamura in Act. Phytotax. Geobot. **19**: 76 (1962).

Phalut, 3500 m (Jun. 4 & 5, 1960, no. 656, fl.).

Distr. Himalaya (Kashmir to Bhutan).

As compared with *Caltha palustris*, the species has more robust erect stems, leaves with numerous smaller teeth and with a more closed sinus, and often larger flowers.

Caltha palustris L., Sp. Pl. ed. 1, **1**: 558 (1753)-Fl. Brit. Ind. **1**: 21 (1872), p.p.-Hara in Journ. Fac. Sci. Univ. Tokyo Bot. **6**: 50 (1952)-Spring Fl. Sikkim Himal. f. 18 (1963).

var. **himalensis** (D. Don) Mukerjee in Bull. Bot. Surv. India **2**: 105 (1960).

C. himalensis D. Don, Prodr. Fl. Nepal. 195 (1825), e typo.

Jongri, 4800 m (May 21, 1960); Gamothang-Migothang, 4200-3900 m (May 30, 1960, fl.); Migothang, 3900 m (May 31, 1960, no. 592, fl.).

Distr. sp. Europe, Caucasus, Siberia, Tibet, Himalaya, China, Korea, Japan, and N. America.

Cimicifuga foetida L., Syst. Nat. ed 12, 659 (1767)-Fl. Brit. Ind. **1**: 30 (1872)-Nakai in Journ. Jap. Bot. **19**: 378 (1943).

Sandakphu-Kala Pokhari, 3200 m (Jun. 7, 1960); Diorali Bhanjang, 3600 m (Nov. 14 & 17, 1963, fr.).

Distr. E. Europe, Siberia, Himalaya (Kashmir to Bhutan), N. Burma, W. & N. China, and Korea.

Clematis Buchananiana DC., Syst. **1**: 140 (1817), ut *Buchaniana*-Fl. Brit. Ind. **1**: 6 (1872), p.p., var. *rugosa* Hook. f. et Thoms.-Gupta in Bull. Bot. Gard. Lucknow **80**: t. 25 (1963).

Bakkim, 2500 m (May 19, 1960, fr.); Murhay, 2000 m (Oct. 23, 1963, fl.); Sinduwa, 2100 m (Oct. 24, 1963, fl.); Iladanda-Selap (Nov. 9, 1963, fl.); Ghatte-Khebang, 1600-2400 m (Nov. 19, 1963, fr.); Yektin-Batasay, 1400-2400 m (Nov. 30, 1963, fr.); Batasay-Bhuspate Danra, 2400-2800 m (Dec. 1, 1963, fr.); Bhandukay Bhanjang-Mai Majuwa, 2700 m (Dec. 3, 1963, fr.).

Distr. Himalaya (Kashmir to NEFA), Khasia, Manipur, N. Burma, Indo-China, and W. China.

Clematis connata DC., Prodr. **1**: 4 (1824)-Fl. Brit. Ind. **1**: 6 (1872)-Gupta, l.c. **80**: t. 26 (1963).

Bilbatay Bhanjang, 2200 m (Oct. 26, 1963, fl. & fr.); Lam Pokhari, 2800 m (Oct. 28, 1963, fr.); Minchin Dhap-Mul Pokhari, 2900-2500 m (Oct. 29, 1963, fr.); Iladanda-Selap, 1800-2600 m (Nov. 9, 1963, fr.); Baroya Khimty-Thakma Khola, 2500-3200 m (Nov. 12 & 16, 1963, fr.); Bhandukay-Yamphodin, 2500-2100 m (Nov. 16, 1963, fr.); Siling Tzokupa, 2800-3000 m (Nov. 21, 1963, fr.); Birwa-Yektin, 2900-1600 m (Nov. 28, 1963, fr.); Batasay-Halhale Bhanjang, 2400-2700 m (Dec. 1, 1963, fr.); Bhandukay Bhanjang, 3000 m (Dec. 3, 1963, fr.).

Distr. Himalaya (Kashmir to Sikkim), Tibet, and W. China.

Clematis gouriana Roxb. ex DC., Syst. **1**: 138 (1817)-Fl. Brit. Ind. **1**: 4 (1872)-Rehder, Bibl. 164 (1949)-Gupta in Bull. Bot. Gard. Lucknow **54**: t. 9 (1961); **78**: 22 (1962); **80**: t. 27 (1963).

Sanguri Bhanjang, 1100 m (Oct. 16, 1963, fl.); Tamur Bridge-Dhankuta, 900 m (Oct. 17, 1963, fl.); Dumhan-Taplejung, 1300 m (Nov. 1, 1963, fl.); Illam-Ranga Pani, 1200-700 m (Dec. 8, 1963, fr.).

Distr. Himalaya, India, Ceylon, Burma, and W. S. & C. China.

Clematis grewiaeflora DC., Syst. **1**: 140 (1817)-Fl. Brit. Ind. **1**: 6 (1872)-Bot. Mag. t. 6369 (1878)-Gupta in Bull. Bot. Gard. Lucknow **80**: t. 28 & 29 (1963).

Taplejung-Garhi Danra, 1900-2200 m (Nov. 3, 1963, bud); Tuwa-Taplethok, 1800-1400 m (Nov. 5, 1963, bud); Zongi-Iladanda, 2800-1800 m (Nov. 12, 1963, fl.);

Baroya Khimty–Thakma Khola, 2500–3200 m (Nov. 16, 1963, fl.); Yamphodin–Ghatte, 2100–1600 m (Nov. 17, 1963, fl.); below Siling Tzokupa–Khebang, 1800 m (Nov. 22, 1963, fl.); Birwa–Yektin, 2900–1600 m (Nov. 28, 1963); Dhara Pani–Illam, 1500–1200 m (Dec. 5, 1963, fl.).

Distr. Himalaya (Kumaon to Bhutan), Assam, and N. Burma.

Clematis montana Hamilton ex DC., Syst. **1**: 164 (1817)–Fl. Brit. Ind. **1**: 2 (1872)–Brühl in Ann. Bot. Gard. Calcut. **5**: 72 (1896)–Tamura in Act. Phytotax. Geobot. **15**: 118 (1954)–Gupta, l.c. **80**: t. 34–37 (1963)–Spring Fl. Sikkim Himal. f. 102 (1963).

Preig Chu–Jongri, 2500–4000 m (May 19, 1960, no. 388, bud); Jongri–Gamothang, 4200–3600 m (May 26, 1960, no. 502 & 516, fl.); Nayathang–Phalut, 3100–3500 m (Jun. 2, 1960, no. 755, fl.); Hati Sar–Minchin Dhap, 2700–2900 m (Oct. 28, 1963, fr.).

Distr. Himalaya (Kashmir to Bhutan), Khasia, Manipur, W. & C. China, and Formosa.

Clematis napaulensis DC., Syst. **1**: 164 (1817)–Fl. Brit. Ind. **1**: 2 (1872)–Bot. Mag. t. 9037 (1925)–Merrill in Brittonia **4**: 55 (1941)–Gupta in Bull. Bot. Gard. Lucknow **54**: t. 14 (1961); **78**: 40 (1962).

Thakma Khola–Yamphodin, 3400–2100 m (Nov. 17, 1963, bud).

Distr. Himalaya (Punjab to Bhutan), and N. Burma.

Clematis sikkimensis (Hook. f. et Thoms.) Drummond ex Burkill in Rec. Bot. Surv. Ind. **10**: 229 (1925).

C. acuminata DC. var. *sikkimensis* Hook. f. et Thoms. in Fl. Brit. Ind. **1**: 6 (1872)–Hand.-Mzt. in Act. Hort. Gothob. **13**: 194 (1939)–Gupta, l.c. **80**: t. 22 (1963).

C. acuminata ssp. *sikkimensis* (Hook. f. et Thoms.) Brühl in Ann. Bot. Gard. Calcut. **5**: 75 (1896).

Tendong–Damthang, 2300 m (Mar. 26, 1963, fr.).

Distr. E. Himalaya (Sikkim to NEFA), Assam, Naga Hills, N. Burma, and W. China (Yunnan).

The plant differs from *C. acuminata* DC. in having larger and broader leaflets 5–12 cm long 2–4.5 cm wide, and smaller flowers with oblong thicker sepals which are 10–12 mm long, 3–3.5 mm wide, acutish at the apex and glabrescent outside except for the margin.

Delphinium stapeliosmum Brühl in Ann. Bot. Gard. Calcut. **5**: 102, t. 121, f. 1–10 (1896)–Tamura in Act. Phytotax. Geobot. **19**: 78 (1962).

Baroya Khimty, 2500 m (Nov. 10, 11, 12 & 16, 1963, fl. & fr.).

Distr. E. Himalaya (Nepal, Bhutan), Khasia, and N. Burma.

Excepting the odour of flowers, our plants agree with *D. stapeliosmum* in the shape of inflorescences and flowers, the hairiness, the colour of flowers, and the shape of seeds.

Isopyrum adiantifolium Hook. f. et Thomson, Fl. Ind. **1**: 42 (1855)–Fl. Brit. Ind. **1**: 23 (1872)–Drummond et Hutchinson in Kew Bull. **1920**: 164 (1920)–Spring Fl. Sikkim Himal. f. 154 (1963).

Senchal, 2300 m (Apr. 6, 1960, fl.); Batasi–Palmajua, 2300–2600 m (May 3, 1960, no. 79, fl.); Garibans–Tonglu, 2800–3000 m (Jun. 7, 1960, fr.).

Distr. E. Himalaya (Nepal, Sikkim), and N. Burma.

Naravelia zeylanica (L.) DC., Syst. **1**: 167 (1817)–Fl. Brit. Ind. **1**: 7 (1872).

Atragene zeylanica L., Sp. Pl. ed. 1, **1**: 542 (1753)–Roxb., Pl. Corom. **2**: t. 188 (1805).

Loohya Mai–Ghorwa, 400 m (Dec. 9, 1963, fr.).

Distr. Tropical Himalaya (Nepal to Assam), India, Ceylon, and Burma.

Paroxygraphis sikkimensis W. W. Smith in Rec. Bot. Surv. Ind. **4** (7): 344 (1913)–Spring Fl. Sikkim Himal. f. 10 & 11 (1963).

Jongri, 4000 m (May 23 & 24, 1960, no. 455, fl.); Choktsering Chu, 4000–4500 m (May 25, 1960, no. 493, fl.); Migothang, 3900 m (May 30 & 31, 1960, fl., fr.).

Distr. E. Himalaya (E. Nepal, Sikkim).

The species is distinctly dioecious. It is noteworthy that the male plants are found in wet muddy places, and the female plants in gravelly places, and their differences are well shown in the photographs of our book cited above. The female plants are much larger than the male, and have larger leaf-blades, smaller narrow petals, and the achenes drop off easily when mature.

Ranunculus adoxifolius Hand.-Mzt. in Act. Hort. Gothob. **13**: 152 (1939).

R. caespitosus (non Thuill. 1799) Wallich ex Hook. f. et Thoms., Fl. Ind. **1**: 33 (1855).

Bakkim–Jongri, 3500–4000 m (May 19, 1960, fl.); Jongri, 4000 m (May 21, 22 & 23, 1960, no. 453, fl.); Choktsering Chu, 4000–4500 m (May 25, 1960, no. 490, fl.); Gamothang, 3800 m (May 29, 1960, fl.); Migothang, 3900 m (May 31, 1960, no. 598, fl.); Migothang–Nayathang (Jun. 1, 1960, fl.); Nayathang–Chia Bhanjang, 3500–3100 m (Jun. 2, 1960, no. 734, fl.).

Distr. E. Himalaya (E. Nepal, Sikkim), and S. Tibet.

I tentatively refer here a group of small alpine plants which have been sometimes included in *R. hirtellus* Royle and sometimes in *R. Brotherusi* Freyn. The specimens cited above are considerably variable, and are glabrescent or sparsely hirsute. The leaves are 3-parted nearly to the base, the leaflets are oblong to obovate, entire or 3-lobed or deeply laciniate, the flowers are about 1 cm in diameter, and the carpels are glabrous. Typical *R. hirtellus* is a much larger plant with larger leaves less deeply lobed, and minutely pubescent achenes.

Ranunculus Brotherusi Freyn in Bull. Herb. Boiss. **6**: 885 (1898)–Hand.-Mzt. in Act. Hort. Gothob. **13**: 148 (1939).

Jongri-Gamothang, 4200–3800 m (May 26, 1960, fl.); Gamothang, 3800 m (May 29, 1960); Sandakphu, 3500 m (Jun. 6, 1960, no. 671, fl.).

Distr. sp. C. Asia, Himalaya (Kashmir to Bhutan), Tibet, and W. & C. China.

Ranunculus diffusus DC., Prodr. **1**: 38 (1824)–Fl. Brit. Ind. **1**: 19 (1872), p.p.–Hand.-Mzt. in Act. Hort. Gothob. **13**: 166 (1939).

R. napaulensis DC., l.c. 39 (1824).

Senchal, 2300 m (Apr. 6 & Jun. 23, 1960, fl., fr.); Kurseong, 1550 m (Apr. 12, 1960, no. 791, fl.); Mani Bhanjang–Batasi, 2000–2100m (May 1, 1960, fr.); Palmajua–Rimbick, 2200–1500 m (May 5, 1960, fl.); Rimbick–Ramam, 1900–2400 m (May 7, 1960, fl.); Yoksam–Bakkim, 1700–2500 m (May 18, no. 420, fr.); near Chia Bhanjang, 3100 m (Jun. 2, 1960, no. 742, fl.); Sandakphu-Garibans, 3500–2800 m (Jun. 7, 1960, no. 707, fr.); Murhay–Bilbatay Bhanjang, 2100–2200 m (Oct. 24, 1963, fr.); Minchin Dhap–Mul Pokhari, 2900–2500 m (Oct. 29, 1963, fr.); Baroya Khimty, 2500 m (Nov. 11, 1963, fl.); Batasay–Bhuspate Danra, 2400–2800 m (Dec. 1, 1963, fr.); Mai Majuwa–

Dhara Pani, 1500–1900 m (Dec. 4, 1963, fl., fr.).

Distr. Himalaya (Kashmir to NEFA), Khasia, Manipur, N. Burma, and China.

Ranunculus microphyllus Hand.-Mzt., Symb. Sin. **7**: 299 (1931); in Act. Hort. Gothob. **13**: 138 & 163 (1939).

R. flaccidus (non Persoon 1795) Hook. f. et Thoms., Fl. Ind. **1**: 38 (1855); Fl. Brit. Ind. **1**: 20 (1872).

Senchal, 2400 m (Apr. 17, 1960, no. 1964, fl.); Ramam–Phalut, 2400–3500 m (May 9, 1960, fl.); below Jongri, 3600 m (May 19, 1960, no. 395, fl.); Nayathang, 3300 m (Jun. 1, 1960, no. 724, fl.); Nayathang–Phalut, 3500–3100 m (Jun. 2, 1960, no. 765); Phalut, 3000–3500 m (Jun. 5, 1960, no. 652, fl.); Bhuspate Danra, 2800 m (Dec. 2, 1963).

Distr. Himalaya (Kashmir to Bhutan), and W. China.

R. cheirophyllus Hayata of Formosa and Celebes is closely allied to this species.

Ranunculus pulchellus C. A. Meyer in Ledeb., Fl. Alt. **2**: 333 (1830)–Fl. Brit. Ind. **1**: 17 (1872).

var. **Stracheyanus** (Maxim.) Hand.-Mzt., l.c. 147, f. 4. 1–8 (1939).

R. affinis var. *Stracheyanus* Maxim., Fl. Tangut. 14 (1889).

Gamothang, 3800 m (May 28 & 29, 1960, no. 533, fl.); Migothang, 3900 m (May 31, 1960, fl.); Nayathang–Chia Bhanjang, 3500–3100 m (Jun. 2, 1960, no. 629 & 732, fl.); Chia Bhanjang–Phalut, 3100–3500 m (Jun. 3, 1960, fl.).

Distr. sp. C. Asia, Siberia, Himalaya, Tibet. Mongolia and W. & N. China.

Thalictrum elegans Wallich ex Royle, Ill. Bot. Himal. 51 (1834)–Fl. Brit. Ind. **1**: 10 (1872)–Lecoyer, Monogr. Thalictr. 102 & 195, t. 4, f. 5 (1885).

Bhandukay Bhanjang, 3100 m (Dec. 3, 1963, fr.).

Distr. Himalaya (Kumaon to Sikkim).

Thalictrum foliolosum DC., Syst. **1**: 175 (1818)–Fl. Brit. Ind. **1**: 14 (1872).

T. Falconeri Lecoyer, l.c. 117 & 196, t. 4, f. 12 (1885).

Kakani, 2100–2200 m (Sep. 24, 1963, fr.); Garhi Danra, 2200 m (Nov. 3, 1963, fl., fr.; cult. in Karuizawa, Sep. 19, 1965, fl.).

Distr. Himalaya (Punjab to Sikkim), Khasia, and Manipur.

Typical *T. foliolosum* has very numerous small leaflets less than 1 cm long and smooth beneath. The plants of Garhi Danra have very tall stems attaining 3 m high, larger leaflets up to 3 cm long, and mauve caducous sepals and filaments.

Thalictrum reniforme Wallich, Pl. Asia. Rar. **2**: 26 (1831)–Fl. Brit. Ind. **1**: 11 (1872)–Lecoyer, l.c. 112 & 234, t. 4, f. 4 (1885).

Kala Pokhari–Sandakphu, 3200 m (Sep. 16, 1964, fl. purple, fr.).

Distr. Himalaya (Kashmir to Sikkim).

Thalictrum saniculaeforme DC., Prodr. **1**: 12 (1824)–Fl. Brit. Ind. **1**: 13 (1872)–Lecoyer, l.c. 140 & 238, t. 5, f. 10 (1885)–W. Wang in Act. Phytotax. Sin. **6**: 371 (1957).

Above Tutay, 2700 m, on a tree (Oct. 26, 1963, fr.).

Distr. Himalaya (Simla to Sikkim), and Yunnan.

Thalictrum virgatum Hook. f. et Thoms., Fl. Ind. 14 (1855)–Fl. Brit. Ind. **1**: 12 (1872)–Lecoyer, l.c. 114 & 248 (1885)–Boivin in Journ. Arn. Arb. **26**: 115, t. 1, f. 25–27 (1945).

Tinjuray, 2800 m, on rocks (Oct. 27, 1963, fr.); Minchin Dhap—Mul Pokhari, 2700 m

(Oct. 29, 1963, fr.); Selap–Walunchung Gola, 2600–3800 m (Nov. 10, 1963).

Distr. E. Himalaya (E. Nepal to Bhutan), and W. China.

Trollius pumilus D. Don, Prodr. Fl. Nepal. 195 (1825)–Fl. Brit. Ind. **1**: 22 (1872)–Brühl in Ann. Bot. Gard. Calcut. **5** (2): 86, t. 113 (1896)–Stapf in Bot. Mag. sub t. 9143 (1928)–Spring Fl. Sikkim Himal. f. 19 (1963).

Gamothang–Migothang, 4200–3900 m (May 30, 1960, fl.); Migothang, 3900 m (May 31, 1960, fl.); Migothang–Nayathang, 3900–3300 m (Jun. 1, 1960, fl.).

Distr. E. Himalaya (Kumaon to Sikkim), Khasia, S. Tibet, and W. China.

LARDIZABALACEAE (by Hiroshi Hara)

Holboellia latifolia Wallich, Tent. Fl. Napal. 24, t. 16 (1824)–Fl. Brit. Ind. **1**: 108 (1872).

Senchal, 2400 m (Apr. 6 & 7, 1960, fl.); Mani Bhanjang–Batasi (May 1, 1960, no. 23, fl.); Rimbick, 2200 m (May 5, 1960, no. 91, fl.); Ramam, 2400 m (May 8, 1960, no. 146, fl.); Chia Bhanjang–Dentam, 3100–2000 m (May 11, 1960, fl.); Bakkim–Jongri, 2500–4000 m (May 19, 1960, no. 373, fl.); Thakma Khola, 3200 m (Nov. 13 & 17, 1963, fr.).

var. **angustifolia** (Wall.) Hook. f. et Thoms. in Fl. Brit. Ind. **1**: 108 (1872).

H. angustifolia Wallich, l.c. 25, t. 17 (1824).

Darjeeling, 2150 m (Apr. 4, 1960, fl.; Jun. 21, 1960); Gangtok, 1650 m (Apr. 26, 1960, fl. green); Sinduwa, 2100 m (Oct. 24, 1963); Mul Pokhari, 2500 m (Oct. 29, 1963, fr.).

Distr. sp. Himalaya (Kumaon to NEFA), Khasia, Manipur, N. Assam, and W. China.

H. angustifolia can easily be distinguished from *H. latifolia* in its typical form. *H. latifolia* from Senchal has broad thin trinerved leaflets acuminate at the apex, and larger rose-pink campanulate flowers 16–17 mm long. While *H. angustifolia* from Darjeeling and Gangtok has narrow thick leaflets, and narrower light green flowers 12–14 mm long and often tinged with dark purple. The former tends to occur at the higher altitudes than the latter, but intermediate forms between the two are sometimes found, and *H. angustifolia* is here treated tentatively as a variety of *H. latifolia.*

BERBERIDACEAE (by Masami Mizushima)

Berberis angulosa Wallich ex Hooker f. et Thomson, Fl. Ind. **1**: 227 (1855)–Fl. Brit. Ind. **1**: 111 (1872)–Bot. Mag. t. 7071 (1889)–Ahrendt in Journ. Linn. Soc. **57**: 113 (1961)–Spring Fl. Sikkim Himal. f. 104 (1963).

Jongri–Gamothang (May 26, 1960, no. 517); Nayathang–Phalut, 3400 m (Jun. 2, 1960, no. 754).

Distr. E. Himalaya (E. Nepal, Sikkim), and S. E. Tibet.

Berberis Chitria Lindley in Bot. Reg. **9**: t. 729 (1823)–Rehder, Man. ed. 2, 234 (1940); Bibl. 172 (1949)–Ahrendt, l.c. 97, f. 6–1, f. 15 (1961).

B. aristata DC. sensu Hook. f. et Thoms., Fl. Ind. **1**: 222 (1855), p.p.–Fl. Brit. Ind. **1**: 110 (1872), p.p.

Murhay, 2000 m (Oct. 23, 1963, fr.); Sinduwa, 2100 m (Oct. 23, & 24, 1963, fr.); Bilbatay Bhanjang, 2200 m (Oct. 25, 1963, fr.); Batasay, 2400 m (Nov. 30, 1963, fr.); Mai Majuwa–Dhara Pani, 1600–1500 m (Dec. 4, 1963, fr.).

Distr. Himalaya (Kashmir to Nepal).

Berberis Hookeri Lemaire in Illust. Hort. **6**: 207 (1859)-Rehder, Man. ed. 2, 231 (1940); Bibl. 170 (1949)-Ahrendt, l.c. 39 (1961).

Chia Bhanjang, 3100 m (Jun. 2, 1960, no. 745, fr.); Hati Sar-Minchin Dhap, 2700-2900 m (Oct. 28, 1963, fr.); Baroya Khimty-Thakma Khola, 2500-3200 m (Nov. 16, 1963, fr.).

Distr. E. Himalaya (E. Nepal to Bhutan), and Assam.

Berberis insignis Hook. f. et Thoms., Fl. Ind. **1**: 226 (1855); Fl. Brit. Ind. **1**: 111 (1872)-Banerji in Journ. Bomb. Nat. Hist. Soc. **51**: 423 (1953)-Ahrendt, l.c. 36, f. 22 (1961).

Observatory Hill, Darjeeling (Apr. 10, 1960, fl.); Bakkim-Jongri, 2500-4000 m (May 19, 1960, fl.); Minchin Dhap-Mul Pokhari, 2900-2500 m (Oct. 29, 1963, fr.); Baroya Khimty-Thakma Khola, 2500-3200 m (Nov. 12, & 16, 1963, fr.); below Siling Tzokupa-Siling Tzokupa, 2100-3100 m (Nov. 21, 1963); Bhuspate Danra, 2800 m (Dec. 2, 1963); Bhuspate Danra-Mai Majuwa, 3100-2000 m (Dec. 3, 1963, fr.).

Distr. E. Himalaya (E. Nepal to Bhutan), and N. Assam.

Six varieties have been segregated based on the colour of young branches, the number of fascicled flowers, the length of pedicels, the texture of leaves and their serrature, etc. But as Hooker and Thomson have pointed out in 1855, these characters can not be freed from a modification by habitat conditions, and through the above cited specimens one may find it.

Berberis levis Franchet in Bull. Soc. Bot. France **33**: 386 (1886)-Ahrendt, l.c. 75 (1961).

Victoria Fall, Darjeeling 1900 m (Apr. 3, 1960, fl.).

Distr. E. Himalaya (Nepal, Sikkim) and W. China (Yunnan).

Berberis Lycium Royle in Trans. Linn. Soc. **17**: 94 (1834); Ill. Bot. Himal. **1**: 64 (1839)-Fl. Brit. Ind. **1**: 110 (1872)-Rehder, Man. ed. 2, 235 (1940); Bibl. 172 (1949)-Ahrendt, l.c. 87 (1961).

Hati Sar-Minchin Dhap, 2700-2900 m (Oct. 28, 1963, fr.).

Distr. Himalaya (Kashmir to Nepal).

Berberis umbellata Wallich ex G. Don, Gen. Hist. **1**: 116 (1831)-Fl. Brit. Ind. **1**: 110 (1872)-Banerji in Journ. Bomb. Nat. Hist. Soc. **51**: 423 (1953)-Ahrendt, l.c. 104 (1961), s. lato, incl. *B. Duthieanam* Schneid. et *B. Thomsonianam* Schneid.

Migothang-Nayathang, 3900-3300 m (Jun. 1, 1960, no. 710, fl.); Chia Bhanjang-Phalut, 3100-3600 m (Jun. 2, 1960, fl.); Minchin Dhap-Mul Pokhari, 2900-2500 m (Oct. 29, 1963, fr.); Walunchung Gola, 3000 m (Nov. 10, 1963, fr.).

Distr. Himalaya (Kashmir to Bhutan).

Berberis Wallichiana DC., Prodr. **1**: 107 (1824)-Fl. Brit. Ind. **1**: 110 (1872), quoad var. 1-Banerji in Journ. Bomb. Nat. Hist. Soc. **51**: 423 (1953)-Ahrendt, l.c. 71 (1961).

Rimbick-Ramam, 1900-2400 m (May 7, 1960, no. 97, fl.); Bilbatay Bhanjang, 2200 m (Oct. 26, 1963); Batasay-Bhuspate Danra, 2400-2800 m (Dec. 1, 1963); Bhuspate Danra, 2800 m (Dec. 2, 1963, fr.)

Distr. E. Himalaya (Nepal to Bhutan).

Mahonia acanthifolia G. Don, Gen. Hist. **1**: 118 (1831)-Takeda in Not. Bot.

Gard. Edinb. **6**: 219, pl. 6, 33, f. 14–23 (1917)–Ahrendt in Journ. Linn. Soc. **57**: 309 (1961).

Batasay-Bhuspate Danra, 2400-2900 m (Dec. 1, 1963, fl.).

Distr. Himalaya (Kumaon to Sikkim), and N. Assam.

Mahonia cf. **borealis** Takeda in Not. Bot. Gard. Edinb. **6**: 221, pl. 8, 33, f. 30–46 (1917)–Ahrendt, l.c. 307 (1961).

Yamphodin–Ghatte, 2100–1600 m (Nov. 18, 1963); Batasay–Bhuspate Danra, 2400–2900 m (Dec. 1, 1963, fl.).

Distr. Himalaya (Kashmir to Sikkim), and N. Assam.

Mahonia napaulensis DC., Syst. Nat. **2**: 21 (1821), excl. β; Prodr. **1**: 109 (1824), excl. β–Takeda, l.c. 216, pl. 1–2, 33, f. 1–5 (1917)–Banerji in Journ. Bomb. Nat. Hist. Soc. **51**: 423 (1953)–Ahrendt, l.c. 312 (1961).

Berberis nepalensis Spreng. sensu Hook. f. et Thoms. in Fl. Brit. Ind. **1**: 109 (1872), quoad var. 1.

Palmajua–Rimbick, 2300–2200 m (May 5, 1960, nos. 88 & 153, fr.); Murhay–Sinduwa, 2000–2100 m (Oct. 23, 1963, fl.); Bhuspate Danra–below Mai Majuwa, 2900–1600 m (Dec. 3, 1963, fl.); below Mai Majuwa–Dhara Pani, 1600–1500 m (Dec. 4, 1963, young fr.).

Distr. E. Himalaya (Nepal, Sikkim).

MENISPERMACEAE (by Hiroo Kanai)

Cissampelos Pareira L., Sp. Pl. ed. 1, 1031 (1753)–Fl. Brit. Ind. **1**: 103 (1872)–Diels in Pfl.-reich IV–94, Ht. **46**: 286 (1910).

Takdah–Rayang, 1600–300 m (Apr. 20, 1960); Kalimpong, 1300 m (Apr. 23, 1960); Dentam–Pamianchi, 1500–2000 m (May 12, 1960); Yoksam, 1700–1800 m (May 17, 1960); Peshok–Tista, Darjeeling, 700 m (June 13, 1960); Dumhan, 700 m (Oct. 31, 1963); Dhara Pani–Illam, 1200 m (Dec. 5, 1963); Chisa Pani, 600 m (Dec. 9, 1963).

Distr. Pantropic.

Parabaena sagittata (Ham.) Miers in Ann. Mag. Nat. Hist. ser. 2, **7**: 39 (1851)–Fl. Brit. Ind. **1**: 96 (1872)–Diels, l.c. 149 (1910).

Cissampelos sagittata Hamilt. in Wall., Cat. no. 4983 (1828), nom. nud.

Peshok, Darjeeling, 900 m (Apr. 27, 1960); Pamianchi–Tingling Bridge, 2000 m 1000 m (May 15, 1960).

Distr. Himalaya (Nepal and Sikkim), Assam, Burma, Malay, Indo-China, and S. China.

Pericampylus glaucus (Lam.) Merrill, Interpr. Rumph. Herb. Amboin. 219 (1917).

Menispermum glaucum Lamarck, Encycl. Méth. **4**: 100 (1797).

Cocculus incanus Colebr. in Trans. Linn. Soc. **13**: 57, t. 17 (1822).

P. incanus (Colebr.) Miers in Ann. Nat. Hist. ser. 2. **7**: 40 (1851)–Fl. Brit. Ind. **1**: 102 (1872)–Diels, l.c. 217 (1910).

Peshok, Darjeeling, 900 m (Apr. 27, 1960).

Distr. E. Himalaya, Assam, Burma, Indo-China, Malaysia, and S. China.

Stephania Delavayi Diels in Pfl.-reich IV–94, Ht. **46**: 275 (1910).

Rimbick–Ramam, 1900–2400 m (May 7, 1960); Yoksam–Bakkim, 1700–2200 m (May 18, 1960); Iladanda–Selap, 2100 m (Nov. 9, 1963).

Distr. New to Nepal and Sikkim. China (Yunnan).

Stephania elegans Hook. f. et Thoms., Fl. Ind. **1**: 195 (1855)-Fl. Brit. Ind. **1**: 103 (1872)-Diels, l.c. 273 (1910).

Nissim-Dumhan, 1000 m (Oct. 30, 1963); Linkhim-Tuwa, 1500 m (Nov. 4, 1963); below Siling Tzokupa-Khebang, 1700 m (Nov. 22, 1963).

Distr. Himalaya (Garhwal to Assam), Khasia, and Naga Hill.

Stephania glandulifera Miers in Ann. Mag. Nat. Hist. ser. 3, **18**: 15 (1866), nom. nud.; in Contr. Bot. **3**: 220 (1871)-Diels, l.c. 271 (1910).

Kathmandu, 1300 m (Sep. 17, 1963).

Distr. E. Himalaya (Nepal, Sikkim), and Assam.

Stephania japonica (Thunb.) Miers in Ann. Mag. Nat. Hist. ser. 3, **18**: 14 (1866), pro parte, excl. Cuming 1160, et Contr. Bot. **3**: 213 (1871), pro parte, excl. Cuming 1160.

Menispermum japonicum Thunb., Fl. Jap. 193 (1784).

var. **discolor** (Miq.) Forman in Kew Bull. **1956** (1): 56 (1956).

Cissampelos hernandiifolia Willd., Sp. Pl. **4**: 861 (1805).

Stephania hernandifolia (Willd.) Walp., Rep. **1**: 96 (1842)-Fl. Brit. Ind. **1**: 103 (1872)-Diels, l.c. 281 (1910).

Dentam-Pamianchi, 1500-2000 m (May 12, 1960); Godavari, south of Kathmandu, 1500 m (Sep. 18, 1963); Biratnagar, 200 m (Oct. 14, 1963); Illam-Jog Mai, 600 m (Dec. 8, 1963); Chisa Pani-Loohya Mai, 500 m (Dec. 9, 1963); Kathgara-Rangali, 200 m (Dec. 14, 1963).

Distr. India, Burma, Indochina, S. China, Malaysia, New Guinea, and Australia.

The relationship between Japanese and Himalayan plants needs further study.

MAGNOLIACEAE (by Hiroshi Hara)

Alcimandra Cathcartii (Hook. f. et Thoms.) Dandy in Kew Bull. **1927**: 260 (1927).

Michelia Cathcartii Hook. f. et Thomson, Fl. Ind. **1**: 79 (1855)-Hook. f., Ill. Himal. Pl. t. 7 (1855)-Fl. Brit. Ind. **1**: 42 (1872).

Takdah, 1600 m (Apr. 19, 1960, bud).

Distr. Himalaya (Sikkim to N. Assam), Naga Hills, Manipur, N. Burma, and Tonkin.

Magnolia Campbellii Hook. f. et Thoms., Fl. Ind. **1**: 77 (1855)-Hook. f., Ill. Himal. Pl. t. 4 & 5 (1855)-Fl. Brit. Ind. **1**: 41 (1872)-Johnstone, Asiat. Magnol. 48, t. 2 & 3, f. 3 & 4 (1955).

Senchal, 2400 m (Apr. 17, 1960, no. 1916, fl.; Jun. 23, 1960); Batasi-Palmajua, 2300-2600 m (May 3, 1960, old fr.); Bakkim-Jongri, 2500-3500 m (May 19, 1960, bud); Tendong Peak, 2700-2850 m (Mar. 26, 1963, fl.).

Distr. sp. Himalaya (Nepal to Bhutan), Manipur, S. E. Tibet, N. Burma, and W. China (Yunnan).

At Senchal, the flowers vary in colour from pink to deep rose-pink by individual and are rarely pure white, but on Tendong Peak in Sikkim they are all white.

Magnolia globosa Hook. f. et Thoms., Fl. Ind. **1**: 77 (1855)-Fl. Brit. Ind. **1**: 41 (1872)-Dandy in Bot. Mag. t. 9467 (1936)-Johnstone, l.c. 116 (1955)-Spring

Fl. Sikkim Himal. f. 127 (1963).

Garibans–Tonglu, 2800–3000 m (Jun. 7, 1960, fl.); Minchin Dhap–Mul Pokhari, 2900–2500 m (Oct. 29, 1963).

Distr. E. Himalaya (E.Nepal to Bhutan), N. E. Assam, S. E. Tibet, N. Burma, and W. China (Yunnan).

This species belongs to Sect. Oyama Nakai, and is allied to *M. Sieboldii* Koch of E. China, Korea, and Japan.

Michelia Doltsopa Hamilton ex DC., Syst. **1**: 448 (1817)–Dandy in Journ. Bot. **65**: 279 (1927); in Bot. Mag. t. 9645 (1943).

Magnolia excelsa Wallich, Tent. Fl. Napal. **1**: 5, t. 2 (1824).

Michelia excelsa (Wall.) Blume ex Wight, Ill. Ind. Bot. **1**: 14 (1838)–Fl. Brit. Ind. **1**: 43 (1872)–King in Ann. Bot. Gard. Calcut. **3**: 215, t. 63 (1891).

St. Paul Hill, Darjeeling, 2200 m (Apr. 9 & 10, 1960, fl.); Sinduwa, 2100 m (Oct. 24, 1963).

Distr. E. Himalaya (Nepal to NEFA), Khasia, S. Tibet, Manipur, N. Burma, and W. China (Yunnan).

Michelia Kisopa Hamilton ex DC., Syst. **1**: 448 (1817)–Wallich, Tent. Fl. Napal. **1**: 8, t. 4 (1824)–Fl. Brit. Ind. **1**: 43 (1872)–King, l.c. 217, t. 58 B (1891)–Dandy in Journ. Bot. **65**: 277 (1927).

Kathmandu Airport, 1400 m (Oct. 13, 1963, fl.); Helok–Iladanda, 1500–1800 m (Nov. 8, 1963, fl., fr.).

Distr. Himalaya (Kumaon to Sikkim).

Michelia velutina DC., Prodr. **1**: 79 (Jan. 1824).

M. lanuginosa Wallich, Tent. Fl. Napal. **1**: 8, t. 5 (Jun. 1824)–Fl. Brit. Ind. **1**: 43 (1872)–Bot. Mag. t. 6179 (1875)–King, l.c. 215, t. 62 (1891)–Dandy in Not. Bot. Gard. Edinb. **16**: 131 (1928).

Dentam–Pamianchi, 1500–2000 m (May 12, 1960, no. 224, fr.); Gangtok, 1600 m (Jun. 17, 1960, young fr.); Taplejung, 1700 m (Nov. 2, 1963, defl., fr.).

Distr. E. Himalaya (Nepal to Bhutan), Khasia, Naga Hills, Manipur, and W. China (Yunnan).

SCHISANDRACEAE (by Hiroshi Hara)

Schisandra grandiflora (Wall.) Hook. f. et Thoms. in Fl. Brit. Ind. **1**: 44 (1872)–A. C. Smith in Sargentia **7**: 100 (1947).

Kadsura grandiflora Wallich, Tent. Fl. Napal. 10, t. 14 (1824).

Ghum, 2300 m (Apr. 4, 1960, bud); Bakkim–Jongri, 2500–4000 m (May 19, 1960, no. 423, fl.); Ramam, 2400m (May 8, 1960, no. 149, fl.); Batasi–Palmajua, 2300–2600m (May 3, 1960, fl.); Chia Baanjan,g 3000 m (Jun. 3, 1960, fl.); Sandakphu–Garibans, 3500–2800 m (Jun. 7, 1960, fl.).

Distr. Himalaya (Punjab to Bhutan).

Schisandra neglecta A. C. Smith in Sargentia **7**: 127, f. 17, g (1947).

Schizandra elongata Hook. f. et Thoms. in Fl. Brit. Ind. **1**: 44 (1872), excl. syn.

Birch Hill, Darjeeling, 2000 m (May 6, 1960, bud); below St. Paul Hill, 2150 m (Jun. 26, 1960, fl.); Yoksam, 1700 m (May 17, 1960, fl.).

Distr. E. Himalaya (Nepal, Sikkim), Khasia, N. Burma, and W. China (Yunnan).

Schisandra propinqua (Wall.) Baillon, Hist. Pl. **1**: 148 (1868–69)–Fl. Brit. Ind. **1**: 45 (1872)–A. C. Smith, l.c. 149 (1947).

Kadsura propinqua Wallich, Tent. Fl. Napal. 11, t. 15 (1824).

Iladanda–Selap (Nov. 9, 1963, fr.).

Distr. sp. Himalaya (Garhwal to Sikkim), Khasia, Burma, and W. & C. China.

ANNONACEAE (by Hiroyoshi Ohashi)

Desmos praecox (Hook. f. et Thoms.) Safford in Bull. Torrey Bot. Cl. **39**: 507 (1912)–Das in Bull. Bot. Surv. Ind. **5**: 42 (1963).

Unona praecox Hooker f. et Thomson, Fl. Ind. **1**:136 (1855)–Fl. Brit. Ind. **1**: 60 (1872)–King in Ann. Bot. Gard. Calcut. **4**: 58, t. 79 (1893).

Sombari–Naya Bazar, 700 m (Mar. 27, 1963, fl. white).

Distr. E. Himalaya (Sikkim, Bhutan) and Assam.

Mitrephora Harai Ohashi, sp. nov. [Pl. 5 b, Fig. 14]

Arbuscula (ca. 3 m alta fide Hara); ramuli primo densius ferrugineo-tomentosi, mox glabri, striati. Folia juniora fulvo-viridia, subcoriacea, angusto-ovata vel angusto-elliptica, apice attenuato-acuminata vel leviter caudata, basi obtusa vel attenuata, supra glabra, subtus dense et breviter et appresse fulvo-pubescentia, nervis lateralibus utrinque 6–9, supra tenuibus conspicuis, subtus prominentibus, margine integra vel leviter undulata. Inflorescentiae 2-florae, flore solum superiore bene evoluto; pedunculis 1–2 mm longis. Flores expansi 4–5 cm diametro (ex Hara); pedicellis 4–6 mm longitudine, adpresse fulvo-pubescentibus; alabastra subglobosa, ferrugineo-tomentosa. Calyx 1 cm longus, dorso ferrugineo-tomentosus, intra sparse pubescens, lobis 3, apice acutis, subrotundis, 6–8 mm longis, 5–8 mm latis, incrassatis. Petala exteriora 3, alba, distincte venulosa, lato-elliptica vel lato-obovata, apice acuta, basi rotundata, 2–2.3 cm longa et 1.2–1.8 cm lata, extra pilis $\frac{1}{4}$–$\frac{1}{2}$ mm longis, dense et adpresse ferrugineo-pubescentia; interiora 3, purpurea, basi viridi-flava (ex Hara), facillime decidua, 1.3–1.7 cm longa, dorso medio sparse pubescentia, intra medio et superne fulvo-pubescentia, unguis 5–10 mm longus, pars expansa triangularis, circiter 7 mm longa, 1.1–1.4 mm lata. Stamina numerosa, spiraliter disposita, 1.2–1.6 mm longa $\frac{1}{2}$–1 mm lata. Carpella 40–50, spiraliter disposita, ellipsoidea, dense adpresse hirsuta, circa 2 mm alta. Ovarium 4–8, sessile.

Sikkim: Tarku, inter Singtam et Temi, 650 m (H. Hara, Mar. 25, 1963, fl., no. 6300075—Typus in TI).

Named in honour of Professor Hiroshi Hara of the University of Tokyo, who collected this beautiful annonaceous plant and was the leader of the Botanical Expeditions of the University of Tokyo to Eastern Himalaya in 1960 and 1963.

This is the first species of the genus to be recorded from the Himalayan Mountains and is strongly characterized by its spirally arranged ellipsoid carpels including 4–8 ovules in two rows. The most nearest ally of the species is *Mitrephora grandiflora* Bedd. of eastern India but differs greatly from it in narrower leaves with the attenuate-acuminate or somewhat caudate apex, smaller flowers, distinctly veined outer petals which are round at the base and sparsely pubescent inside, triangular or sagittate claw of inner petals which are purple in colour, smaller stamens with the minutely ciliate truncate apex having long and short-anthers in dorsal surface, and ellipsoid carpels.

Uvaria Hamiltoni Hooker f. et Thomson, Fl. Ind. **1** : 96 (1855)–Fl. Brit. Ind.

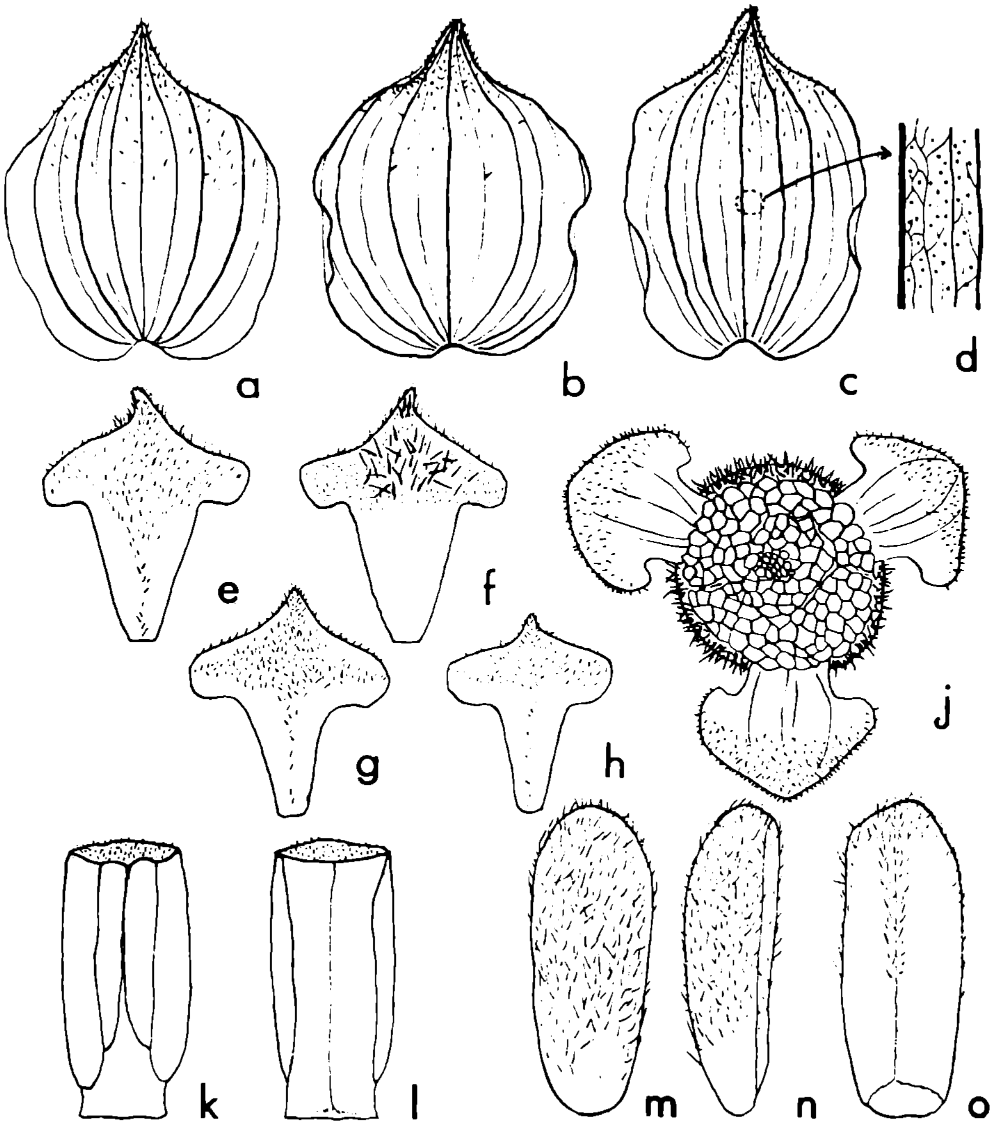

Fig. 14. *Mitrephora Harai* Ohashi

a–c. Ventral view of three outer petals with ferruginous-pubescent at and near the apex, ×1.3. d. Portion of outer petal showing the pattern of minor venation and gland-dots, ×3.3. e & g–h. Dorsal view of inner petals, ×1.3. f. Ventral view of fig. e showig the claw being covered with minutely tawny-pubescent mixed with longer strict brownish hairs, ×1.3. j. Unfolded bud from which sepals and outer petals are removed, showing three juvenile inner petals, stiff hairs on receptacle, and spirally arranged stamens and carpels, ×2. k–l. Stamen (k. Dorsal view. l. Ventral view, flat connective with truncate, minutely ciliate apex is shown), ×20. m–o. Carpel (m. Dorasl view. n. Side view. o. Ventral view), ×14.

1: 48 (1872)-King in Ann. Bot. Gard. Calcut. **4**: 17, t. 6 (1893)-Das in Bull. Bot. Surv. Ind. **5**: 39 (1963).

Ranga Pani-Ghorwa, 700-300 m (Dec. 9, 1963).

Distr. E. Himalaya (E. Nepal, Sikkim), India, Burma, Thai, and Andaman Isl.

LAURACEAE (by Yasuiti Momiyama)

Actinodaphne reticulata Meisn. in DC., Prodr. **15** (1): 212 (1864)-Hook. f., Fl. Brit. Ind. **5**: 147 (1886)-Allen in Ann. Miss. Bot. Gard. **25**: 412 (1938).

Mani Bhanjang-Batasi, 2000 m (May 1, 1960, fr.).

Distr. E. Himalaya (Nepal), and Khasia.

Actinodaphne sikkimensis Meisn. in DC., Prodr. **15** (1): 213 (1864)-Fl. Brit. Ind. **5**: 147 (1886).

Takdah, 1600-1700 m (Apr. 18 & 19, 1960, fr.); Yoksam-Bakkim, 1700-2200 m (May 18, 1960, fr.).

Distr. E. Himalaya (Sikkim), and Manipur.

Cinnamomum Camphora (L.) Sieb., Syn. Pl. Oec. Jap. 23 (1830)-Nees et Eberm., Handb. Med. Pharm. Bot. **2**: 430 (1831).

Laurus Camphora L., Sp. Pl. ed. 1, 369 (1753).

Balaju Water Garden, Kathmandu, cult., 1500 m (Sep. 23, 1963, fr.).

Distr. China, and Japan.

Cinnamomum glanduliferum (Wall.) Meisn. in DC., Prodr. **15** (1): 25 (1864)-Fl. Brit. Ind. **5**: 135 (1886)-Allen in Journ. Arn. Arb. **20**: 46 (1939).

Laurus glandulifera Wall. in Trans. Soc. Med. Phys. Calcut. **1**: 45 & 51, t. 1 (1825).

Camphora glandulifera (Wall.) Nees in Wall., Pl. Asia. Rar. **2**: 72 (1831); Syst. Laur. 90 (1836).

Rimbick-Ramam, 1900-2400 m (May 7, 1960, fl.); Iladanda-Selap, 1800-2600 m (Nov. 9, 1963).

Distr. Himalaya (?Kumaon, Nepal), Khasia, Burma, Malay, and C. & S. China.

Cinnamomum obtusifolium Nees in Wall., Pl. Asia. Rar. **2**: 73 (1831); Syst. Laur. 33 (1836)-Meisn. in DC., Prodr. **15** (1): 12 (1864)-Fl. Brit. Ind. **5**: 128 (1886)-Allen, l.c. 61 (1939).

Takdah, 1600-1700 m (Apr. 19, 1960); Yoksam-Bakkim, 1700-2200 m (May 18, 1960, fl.); Tista Bazar-Lopchu (Jun. 20, 1960, fl.); Ghatte-Khebang, 1600-2400 m (Nov. 19, 1963); Mai Majuwa-Dhara Pani, 1500-1900 m (Dec. 4, 1963); Darjeeling, 2100 m (Dec. 25, 1963).

Distr. E. Himalaya (Nepal, Sikkim), Assam, Khasia, Burma, Andaman Islands, and W. & S. China.

Cinnamomum Tamala (Hamilt.) Nees et Eberm., Handb. Med. Pharm. Bot. **2**: 426 (1831)-Nees in Wall., Pl. Asia. Rar. **2**: 75 (1831); Syst. Laur. 56 & 666 (1836)-Meisn. in DC., Prodr. **15** (1): 17 (1864)-Fl. Brit. Ind. **5**: 128 (1886)-Allen, l.c. 53 (1939).

Laurus Tamala Hamilt. in Trans. Linn. Soc. **13**: 555 (1822).

Yoksam, 1800 m (May 17, 1960, fl.).

Distr. Himalaya (the Indus to Bhutan), and Khasia.

Cryptocarya amygdalina Nees in Wall., Pl. Asia. Rar. **2**: 69 (1831); Syst. Laur. 208 (1836)–Meisn. in DC., Prodr. **15** (1): 72 & 507 (1864)–Fl. Brit. Ind. **5**: 118 (1886).

Gangtok, 1600 m (Jun. 14, 1960, fr.).

Distr. E. Himalaya (Nepal, Sikkim), Khasia and Assam.

Dodocadenia grandiflora Nees in Wall., Pl. Asia. Rar. **2**: 63 (1831); Syst. Laur. 588 (1836)–Meisn. in DC., Prodr. **15** (1): 210 (1864)–Fl. Brit. Ind. **5**: 181 (1886).

Bilbatay Bhanjang–Hati Sar, 2400–2900 m (Oct. 27, 1963, bud); Hati Sar–Minchin Dhap, 2700–2900 m (Oct. 28, 1963, fr., bud.); Minchin Dhap–Mul Pokhari, 2900–2500 m (Oct. 29, 1963, fr.); Helok–Baroya Khimty, 1500–2500 m (Nov. 10, 1960, bud); Bhuspate Danra, 2800 m (Dec. 2, 1963).

Distr. Himalaya (Kumaon, Nepal), and Burma.

Lindera assamica (Meisn.) Kurz, For. Fl. Brit. Burma **2**: 308 (1877)–Fl. Brit. Ind. **5**: 182 (1886)–Allen in Journ. Arn. Arb. **22**: 1 (1941).

Aperula assamica Meisn. in DC., Prodr. **15** (1): 240 (1864), p.p.

Rimbick–Ramam, 1900–2400 m (May 7, 1960, fl. ♀); Senchal, 2350 m (Dec. 27, 1963, fl. ♀); Baroya Khimty, 2500 m (Nov. 11, 1963, fl. ♀).

Distr. E. Himalaya (E. Nepal to Bhutan), and Burma.

Lindera heterophylla Meisn. in DC., Prodr. **15** (1): 246 (1864)–Fl. Brit. Ind. **5**: 186 (1886).

Ramam–Phalut, 2500–3600 m (May 9, 1960); Sandakphu–Garibans, 3600–2800 m (Jun. 7, 1960, fr.); Minchin Dhap–Mul Pokhari, 2900–2500 m (Oct. 29, 1963); Siling Tzokupa 2100–3100 m (Nov. 21, 1963, fr.).

Distr. E. Himalaya (E. Nepal to Bhutan).

Lindera latifolia Hook. f., Fl. Brit. Ind. **5**: 183 (1886)–Allen, l.c. 7 (1941).

Gangtok, 1400 m (Jun. 16, 1960, bud).

Distr. E. Himalaya (Sikkim), Khasia, Myrung and Pomarang, Nyrmai, and W. China (Yunnan).

Lindera Nacusua (D. Don) Merrill in Lingn. Sci. Journ. **15**: 419 (1936)–Allen, l.c. 9 (1941).

Laurus Nacusua D. Don, Prodr. Fl. Nepal. 64 (1825).

Daphnidium bifarium Nees in Wall., Pl. Asia. Rar. **2**: 63 (1831); Syst. Laur. 616 (1836)–Meisn. in DC., Prodr. **15** (1): 231 (1864).

Lindera bifaria (Nees) Benth. ex Hook. f., Fl. Brit. Ind. **5**: 184 (1886).

Godavari, near Kathmandu, 1500 m (Sep. 13, 1963, fr., bud); Gakarna Forest, northeast of Kathmandu, 1400 m (Sep. 22, 1963, fr.); Balaju, north of Kathmandu (Sep. 23, 1963, fr.); Pouwa, Kathmandu, 1600 m (Oct. 9, 1963, fr.); Kathmandu (Dec. 27, 1963, bud).

Distr. Himalaya (Kumaon, Nepal), N. Assam, Khasia, Manipur, Burma, Indo-China, and W. & S. China.

Lindera Neesiana (Nees) Kurz, For. Fl. Brit. Burma **2**: 309 (1877)–Fl. Brit. Ind. **5**: 186 (1886)–Merrill in Brittonia **4**: 61 (1941).

Benzoin Neesianum Nees in Wall., Pl. Asia. Rar. **2**: 63 (1831); Syst. Laur. 498 (1836).

Aperula Neesiana (Nees) Bl., Mus. Bot. Lugd.-Bat. **1**: 366 (1851)–Meisn. in DC., Prodr. **15** (1): 241 (1864).

Murhay, 2000 m (Oct. 23, 1963, bud); Sinduwa, 2100 m (Oct. 24, 1963 bud); Bilbatay Bhanjang-Hati Sar, 2200–2900 m (Oct. 27, 1963, fl. ♂); Minchin Dhap-Mul Pokhari, 2900–2500 m (Oct. 29, 1963, fl. ♂, bud); Iladanda-Selap, 1800–2600 m (Nov. 9, 1963, fl. ♂); above Lelep (Nov. 9, 1963, fl. ♂); Baroya Khimty, 2500 m (Nov. 11, 1963, fl. ♂); Thakma Khola-Bhandukay, 3000–2500 m (Nov. 14, 1963, fl. ♂; Nov. 17, 1963, bud); Yektin-Akasay, 1400–2300 m (Nov. 30, 1963, fl. ♂, bud); Mai Majuwa-Dhara Pani, 1500–1900 m (Dec. 4, 1963, fl. ♂)

Distr. E. Himalaya (Nepal, Sikkim), and Burma.

Lindera pulcherrima (Nees) Benth. ex Hook. f., Fl. Brit. Ind. **5**: 185 (1886)–Allen, l.c. 20 (1941).

Daphnidium pulcherrimum Nees in Wall., Pl. Asia. Rar. **2**: 63 (1831); Syst. Laur. 610 (1836)–Meisn. in DC., Prodr. **15** (1): 229 (1864).

Ramam, 2400 m (May 8, 1960, fl. ♀); Senchal-Tiger Hill, 2400–2500 m (Jun. 23, 1960, fl. ♀); Tendong-Damthang, 2500 m (Mar. 26, 1963, bud); Minchin Dhap-Mul Pokhari, 2900–2500 m (Oct. 29, 1963, bud); Baroya Khimty, 2500 m (Nov. 11, 1963); Diorali Bhanjang-Bhandukay (Nov. 14, 1963); Bhandukay-Yamphodin, 2500–2100 m (Nov. 16, 1963); Baroya Khimty-Thakma Khola (Nov. 16, 1963, bud).

Distr. Himalaya (Kumaon to Bhutan), Khasia, and Assam.

Lindera reticulata (Nees) Benth. ex Hook. f., Fl. Brit. Ind. **5**: 184 (1886).

Polyadenia reticulata Nees in Wall., Pl. Asia. Rar. **2**: 61 (1831); Syst. Laur. 572 (1836)–Meisn. in DC., Prodr. **15** (1): 232 (1864).

Takdah, 1600–1700 m (Apr. 19, 1960).

Distr. Darjeeling, and Assam.

Litsea Cubeba (Lour.) Pers., Syn. Pl. **2** (1): 4 (1806)–Rehder in Journ. Arn. Arb. **11**: 157 (1930)–Allen in Ann. Miss. Bot. Gard. **25**: 368 (1938).

Laurus Cubeba Loureiro, Fl. Cochinch. **1**: 252 (1790).

Litsea citrata Bl., Bijdr. 565 (1825)–Fl. Brit. Ind. **5**: 155 (1886).

Tetranthera polyantha Wall. ex Nees in Wall., Pl. Asia. Rar. **2**: 67 (1831); Syst. Laur. 545 (1836)–Meisn. in DC., Prodr. **15** (1): 182 (1864).

Daphnidium Cubeba Nees, Syst. Laur. 615 (1836).

Tetranthera citrata Nees, Syst. Laur. 560 (1836).

Tetranthera Cubeba (Lour.) Meisn. in DC., Prodr. **15** (1): 199 (1864).

Rimbick-Ramam, 1900–2400 m (May 7, 1960, fl. ♀); Taplejung, 1700 m (Nov. 2, 1963); Taplethok-Helok (Nov. 6, 1963, bud); Helok, 1500 m (Nov. 7, 1963, bud); Khebang, 1400 m (Nov. 23, 1963, fl. ♂, bud); Khebang-Bharomdin, 1700–1000 m (Nov. 24, 1963, bud); Yektin, 1100 m (Nov. 29, 1963, fl. ♂, bud).

Distr. E. Himalaya (Sikkim to Mishmi), Khasia, Burma, Tonkin, W. & C. China, Formosa, and Java.

Litsea elongata (Nees) Hook. f., Fl. Brit. Ind. **5**: 165 (1886)–Allen, l.c. 390 (1938).

Daphnidium? elongatum Nees in Wall., Pl. Asia. Rar. **2**: 63 (1831); Syst. Laur. 620 (1836)–Meisn. in DC., Prodr. **15** (1): 231 (1864).

Ramam, 2400 m (May 8, 1960, fr.); Minchin Dhap-Mul Pokhari, 2900–2500 m (Oct. 29, 1963); Baroya Khimty-Thakma Khola, 2500–3200 m (Nov. 16, 1963, fl. ♂); Thakma Khola-Yamphodin (Nov. 17, 1963, fl. ♀).

Distr. Himalaya (Garhwal to Bhutan), Tibet, Khasia, and east to W. & C. China.

Litsea Kingii Hook. f., Fl. Brit. Ind. **5**: 156 (1886).

Minchin Dhap-Mul Pokhari, 2900–2500 m (Oct. 29, 1963, bud); below Siling Tzokupa, 2100–3100 m (Nov. 21, 1963, bud).

Distr. E. Himalaya (E. Nepal, Sikkim), Khasia, and W. China (S. Yunnan).

Litsea monopetala (Roxb.) Persoon, Syn. Pl. **2** (1): 4 (1806)–Allen, l.c. 387 (1938).

Tetranthera monopetala Roxb., Pl. Corom. **2**: 26, t. 148 (1800); Fl. Ind. ed. 2, **3**: 821 (1832)–Nees in Wall., Pl. Asia. Rar. **2**: 66 (1831); Syst. Laur. 525 (1836)–Meisn. in DC., Prodr. **15** (1): 189 (1864).

Litsea polyantha Juss. in Ann. Mus. Hist. Nat. **6**: 211 (1805)–Fl. Brit. Ind. **5**: 162 (1886).

Middle Camp, Singtam–Gangtok, 700 m (Mar. 29, 1963, fl. ♂).

Distr. Himalaya, India east to W. & S. China, and Malaysia.

Litsea oblonga (Wall.) Hook. f., Fl. Brit. Ind. **5**: 168 (1886).

Tetranthera oblonga Wall. ex Nees in Wall., Pl. Asia. Rar. **2**: 67 (1831); Syst. Laur. 551 (1836).

Cylicodaphne oblonga Meisn. in DC., Prodr. **15** (1): 205 (1864).

Gangtok, Orchid Sanctuary, 1500 m (Mar. 18, 1963, bud); Middle Camp, Singtam-Gangtok, 700 m (Mar. 29, 1963, fl. ♂).

Distr. E. Himalaya (Nepal, Sikkim), and Khasia.

Litsea sericea (Nees) Hook. f., Fl. Brit. Ind. **5**: 156 (1886)–Allen, l.c. 369 (1938).

Tetranthera sericea Wall. ex Nees in Wall., Pl. Asia. Rar. **2**: 67 (1831); Syst. Laur. 565 (1836)–Meisn. in DC., Prodr. **15** (1): 181 (1864).

Garibans–Tonglu, 2800–3000 m (Jun. 7, 1960); Minchin Dhap–Mul Pokhari, 2900–2500 m (Oct. 29, 1963); above Lelep, 1600–2600 m (Nov. 9, 1963, fr.); Siling Tzokupa, 2100–3100 m (Nov. 21, 1963, bud).

Distr. E. Himalaya (Nepal to Bhutan), Manipur, and W. & C. China (Szechuan, W. Hupeh, W. Kiangsi).

Machilus Duthiei King ex Hook. f., Fl. Brit. Ind. **5**: 861 (1890).

Ramam, 2400 m (May 8, 1960, fl.); Iladanda–Selap, 1800–2600 m (Nov. 9, 1963, fr.)

Distr. Himalaya (Chamba to ?Sikkim), and Khasia.

Machilus edulis King ex Hook. f., Fl. Brit. Ind. **5**: 138 (1886).

Takdah, 1600–1700 m (Apr. 19, 1960, fl.); Yoksam, 1800 m (May 17, 1960).

Distr. E. Himalaya (Sikkim).

Neolitsea lanuginosa (Nees) Gamble in Pl. Wilson. **2** (1): 79 (1914).

Tetradenia lanuginosa Nees in Wall., Pl. Asia. Rar. **2**: 64, t. 576 (1831), sphalmate *Tatranthera.*

Litsea lanuginosa Nees, Syst. Laur. 634 (1836)–Meisn. in DC., Prodr. **15** (1): 221 (1864)–Fl. Brit. Ind. **5**: 178 (1886).

Kathmandu, 1400 m (Dec. 29, 1963, fl. ♂, bud).

Distr. Himalaya (Kashmir to Sikkim), and Khasia.

Neolitsea umbrosa (Nees) Gamble in Pl. Wilson. **2** (1): 79 (1914).

Tetradenia umbrosa Nees in Wall., Pl. Asia. Rar. **2**: 64 (1831); **3**: 30 (1832).

Litsea umbrosa Nees, Syst. Laur. 623 (1836)-Meisn. in DC., Prodr. **15** (1): 223 (1864)-Fl. Brit. Ind. **5**: 179 (1886).

Minchin Dhap-Mul Pokhari, 2900–2500 m (Oct. 29, 1963, bud); Bhuspate Danra-Mai Majuwa, 1600–3000 m (Dec. 3, 1963, bud).

Distr. Himalaya (Kashmir to Sikkim), Khasia, Manipur, and W. China (W. Szechuan).

Phoebe lanceolata (Nees) Nees, Syst. Laur. 109 (1836)-Meisn. in DC., Prodr. **15** (1): 34 (1864)-Fl. Brit. Ind. **5**: 141 (1886).

Ocotea lanceolata Nees in Wall., Pl. Asia. Rar. **2**: 71 (1831).

Rayang, 350 m (Apr. 20, 1960, fl.); Phusri-Sanguri Bhanjang-Dhara Pani, 450–1200 m (Oct. 16, 1963).

Distr. Himalaya (Simla to Sikkim), Khasia, S. Deccan, and Burma.

Phoebe pallida (Nees) Nees, Syst. Laur. 112 (1836)-Meisn. in DC., Prodr. **15** (1): 34 (1864)-Fl. Brit. Ind. **5**: 142 (1886).

Ocotea pallida Nees in Wall., Pl. Asia. Rar. **2**: 71 (1831).

Dumhan, 800 m, rocky hill (Oct. 31, 1963); Yektin, 1100 m (Nov. 29, 1963).

Distr. Himalaya (Kumaon to ?Sikkim), and E. Oude.

Phoebe paniculata Nees, Syst. Laur. 105 (1836)-Meisn. in DC., Prodr. **15** (1): 37 (1864)-Fl. Brit. Ind. **5**: 142 (1886).

Gokarna Forest, Kathmandu, 1500 m (Sep. 22, 1963, fr.).

Distr. E. Himalaya (Nepal), Nilghiri Hills, and Burma.

PAPAVERACEAE (by Hiroshi Hara)

Argemone mexicana L., Sp. Pl. ed. 1, **1**: 508 (1753)-Fl. Brit. Ind. **1**: 117 (1872)-Fedde in Pfl.-reich IV-104, Ht. **40**: 273 (1909)-Ownbey in Mem. Torrey Bot. Cl. **21**: 29 (1958).

Biratnagar, 200 m (Oct. 14, 1963, fl.).

Distr. Naturalized from Americas.

Corydalis chaerophylla DC., Prodr. **1**: 128 (1824)-Wallich, Tent. Fl. Napal. 52, t. 40 (1826)-Fl. Brit. Ind. **1**: 126 (1872)-Prain in Journ. Asia. Soc. Beng. **65**: 32 (1896)-Ryberg in Act. Hort. Berg. **17**: 148, figs. (1955).

Garibans-Tonglu, 2800–3000 m (Jun. 7, 1960, fl.); Sinduwa, 2100 m (Oct. 24, 1963, fl. & fr.); Minchin Dhap-Mul Pokhari, 2900–2500 m (Oct. 29, 1963); Thakma Khola, 3000 m (Nov. 13, 1963).

Distr. Himalaya (Kumaon to Sikkim), and Naga Hills.

var. **geraniifolia** (Hook. f. et Thoms.) Hara, comb. nov.

Corydalis geraniifolia Hook. f. et Thoms., Fl. Ind. **1**: 269 (1855)-Prain, l.c. 33 (1896).

Thakma Khola-Yamphodin, 3500–1700 m (Nov. 17, 1963, fr.); Bhandukay Bhanjang, 3200 m (Dec. 3, 1963, fr.; cult. in Karuizawa, Oct. 1966, fl.).

Distr. E. Himalaya (Nepal, Sikkim).

Corydalis longipes DC., Prodr. **1**: 128 (1824)-Prain, l.c. 28 (1896)-Ryberg, l.c. 146 (1955).

C. sibirica Pers. sensu Fl. Brit. Ind. **1**: 125 (1872).

var. **Smithii** Fedde, Rep. **16**: 315 (1920).

Tonglu, 3000 m (Sep. 16, 1964, fl.).

Distr. Himalaya (Garhwal to Sikkim), and Khasia.

It seems to be better to unite *C. longipes* var. *Burkillii* Fedde with this variety.

Dicentra paucinervia K. R. Stern in Brittonia **13**: 45, f. 31, 1–8 (1961).

Namchi–Damthang, 2000 m (Mar. 27, 1963, fl.).

Distr. E. Himalaya (Sikkim to NEFA), Khasia, Naga Hills, and N.E. Burma.

Dicentra scandens (D. Don) Walpers, Rep. **1**: 118 (1842)–Stern, l.c. **13**: 46, f. 32 (1961).

Diclytra scandens D. Don, Prodr. Fl. Nepal 198 (1825).

Dactylicapnos thalictrifolia Wallich, Tent. Fl. Napal. 51, t. 39 (1826).

Dicentra thalictrifolia (Wall.) Hook. f. et Thoms., Fl. Ind. **1**: 273 (1855)–Fl. Brit. Ind. **1**: 121 (1872).

Murhay, 2100 m (Oct. 22 & 23, 1963, fr.); Sinduwa, 2100 m (Oct. 24, 1963, fr.); Bilbatay Bhanjang, 2200 m (Oct. 26, 1963, fl. & fr.); Mai Majuwa–Dhara Pani (Dec. 4, 1963, fr.); Darjeeling, 2200 m (Dec. 26, 1963, fr.); Lagyap, 2200 m (Sep. 13, 1964, fl. & fr.).

Distr. E. Himalaya (Nepal to Bhutan), Khasia, Burma, Indo-China, and W. China (Yunnan).

Fumaria Vaillantii Loiseleur in Desvaux, Journ. de Bot. **2**: 358 (1809).

F. parviflora Lamarck subsp. *Vaillantii* (Loisel.) Hooker f., Fl. Brit. Ind. **1**: 128 (1872).

Biratnagar, 200 m (Dec. 21, 1963, fl. & fr.).

Distr. Europe, W. Asia, and W. Siberia. A weed in India.

Meconopsis napaulensis DC., Prodr. **1**: 121 (1824)–Prain in Journ. Asia. Soc. Beng. **64**: 317 (1895)–Taylor et Cox, Account Meconop. 44 (1934). [Pl. 6 b]

M. Wallichii Hooker in Bot. Mag. t. 4668 (1852)–Fl. Brit. Ind. **1**: 119 (1872)–Prain, l.c. 318 (1895)–Fedde in Pfl.-reich IV–104, Ht. **40**: 369 (1909).

Migothang–Nayathang, 3900–3300 m (Jun. 1, 1960, no. 725, bud); Phalut (Jun. 5, 1960, no. 665); Phalut–Sandakphu, 3500 m (Jun. 6, 1960, no. 683, bud); Tonglu–Gatribas, 3000–2800 m (Sep. 16, 1964, fl.); Minchin Dhap, 2900 m (Oct. 28 & 29, 1963, fr.); Selap–Walunchung, 2600–3800 m (Nov. 10, 1963, fr.); Thakma Khola–Diorali Bhanjang, 3200–3400 m (Nov. 14 & 16, 1963, fr.).

Distr. E. Himalaya (Nepal to Bhutan), S. Tibet, and W. China.

The flowers of our collection are light blue.

Meconopsis paniculata (D. Don) Prain in Journ. Asia. Soc. Beng. **64**: 316 (1895)–Fedde, l.c. 267 (1909)–Taylor et Cox, l.c. 39 (1934).

Papaver paniculatum D. Don, Prodr. Fl. Nepal. 197 (1825), p.p., nom. illegit.

M. nipalensis DC. sensu Fl. Brit. Ind. **1**: 118 (1872).

Jongri–Olothang, 3600 m (May 23, 1960, fl.); Jongri–Gamothang (May 26, 1960, no. 518, fr.).

Distr. Himalaya (Garhwal to NEFA).

Meconopsis simplicifolia (D. Don) Walpers, Rep. **1**: 110 (1842)–Fl. Brit. Ind. **1**: 118 (1872)–Fedde, l.c. 263 (1909)–Taylor et Cox, l.c. 50 (1934).

Papaver simplicifolium D. Don, Prodr. Fl. Nepal. 196 (1825).

Jongri–Olothang, 3800 m (May 23, 1960, no. 474, fr.); Gamothang, 3800 m (May 27, 1960, no. 514, fl.); Migothang, 4000 m (May 31, 1960); Migothang–Nayathang, 3800 m (Jun. 1, 1960, fl.).

Distr. E. Himalaya (Nepal to Bhutan), and S. Tibet.

Meconopsis villosa (Hook. f.) Taylor in Taylor et Cox, Account Meconop. 28 (1934).

Cathcartia villosa Hooker f. in Bot. Mag. t. 4596 (1851)-Fl. Brit. Ind. **1**: 119 (1872)-Fedde, l.c. 245 (1909).

Phalut-Chia Bhanjang, 3300 m (May 11, 1960); Migothang-Nayathang, 3900-3300 m (Jun. 1, 1960, no. 726).

Distr. E. Himalaya (E. Nepal to Bhutan).

CAPPARIDACEAE (by Hiroyoshi Ohashi)

Capparis acutifolia Sweet, Hort. Brit. ed. 2, 585 (1830).

subsp. **viminea** (Hook. f. et Thoms.) Jacobs in Blumea **12**: 429 (1965).

C. viminea (non Oliver, 1868) Hook. f. et Thoms. in Fl. Brit. Ind. **1**: 179 (1872)-Gagnep. in Fl. Gén. Indo-China **1**: 183 (1908)-Rehder in Journ. Arn. Arb. **17**: 332 (1936).

C. membranifolia Kurz in Journ. Asia. Soc. Beng. **42** (2): 70 (1874).

Naya Bazar-Namchi, Sikkim, 1000 m (Mar. 27, 1963, fl.).

Distr. E. Himalaya (Sikkim, Bhutan), Assam, Burma, Indo-China, and China (Kweichow, Kwangsi, Hainan).

Capparis multiflora Hooker f. et Thomson in Fl. Brit. Ind. **1**: 178 (1872)-Jacobs, l.c. 475 (1965).

Below Siling Tzokupa-Khebang, 1800 m (Nov. 22, 1963, fl. & fr.).

Distr. E. Himalaya (E. Nepal to Bhutan), Assam, Burma, and W. China (Yunnan).

Capparis olacifolia Hooker f. et Thomson in Fl. Brit. Ind. **1**: 178 (1872)-Jacobs, l.c. 475, f. 29 (1965).

Takdah-Rayang, 250 m (Apr. 20, 1960, no. 2189, fl.).

Distr. E. Himalaya (Nepal to Bhutan), Assam, E. Deccan, and Burma.

Capparis spinosa L., Sp. Pl. ed. 1, 503 (1753)-Fl. Brit. Ind. **1**: 173 (1872)-Pax & Hoffmann in Engl., Pfl.-fam. ed. 2, **17 b**: 174, f. 85 A-D (1936)-Jacobs in Fl. Males. **6**: 89 (1960); in Blumea **12**: 416 (1965).

Biratnagar, 200 m (Oct. 15, 1963, fl.).

Distr. Mediterranean Region, Iran, Afghanistan, C. Asia, Himalaya (Kashmir to Nepal), and India.

Cleome gynandra L., Sp. Pl. ed. 1, 671 (1753)-Jacobs in Fl. Males. **6**: 101 (1960)-Iltis in Brittonia **12**: 284 (1960).

C. pentaphylla L., Sp. Pl. ed. 2, 938 (1763).

Gynandropsis pentaphylla (L.) DC., Prodr. **1**: 238 (1824)-Fl. Brit. Ind. **1**: 171 (1872)-King in Journ. Asia. Soc. Beng. **58** (2): 392 (1889).

Dhara Pani-Tamur Bridge, 900-300 m (Oct. 17, 1963, fl. & fr.).

Distr. Himalaya, India, Ceylon, Indo-China, China, Malaysia, and introduced widely in tropical America.

Cleome speciosa Rafinesque, Fl. Ludovic. 86 (1817)-Jacobs, l.c. 101 (1960).

Gynandropsis speciosa (Rafin.) DC., l.c. 238 (1824).

Tuwa-Taplethok, 1800-1400 m (Nov. 5, 1963, fl.); below Siling Tzokupa-Khebang, 2100–1700 m (Nov. 22, 1963, fl. & fr.); Tharpu, 1200 m (Nov. 26, 1963, fl. & fr.); Dhara Pani–Illam, 1500–1200 m (Dec. 5, 1963, fl. & fr., a form with white flowers); Illam, 1200 m (Dec. 7, 1963 fl. & fr.).

Distr. Introduced from tropical America and naturalized in tropical Asia.

Cleome viscosa L., Sp. Pl. ed. 1, 672 (1753)–Fl. Brit. Ind. **1**: 170 (1872)–Jacobs, l.c. 103 (1960)–Iltis, l.c. 281 (1960).

Bagdogra, 200 m (Jun. 27, 1960, fl. & fr.); Sibganja–Mahara Bahara, 200 m (Dec. 12, 1963, fl. & fr.).

Distr. Native in tropical Asia, Africa, and Australia, and introduced widely in tropical America.

Our specimens are referred to f. *viscosa*, the typical form of this species with many short glandular hairs on stems, the undersurface of leaves, pedicel, calyx, ovary and capsule.

Crateva religiosa Forster f., Pl. Escul. Ins. Oc. Austral. 45 et Fl. Ins. Austral. Prod. 35 (1786), ut *Crataeva*–DC., Prodr. **1**: 243 (1824), p.p.–Fl. Brit. Ind. **1**: 172 (1872), p.p.–Pax & Hoffmann in Engl., Pfl.-fam. ed. 2, **17 b**: 168, f. 82 (1936)–Jacobs in Fl. Males. **6**: 65 (1960); in van Steenis, Pacific Pl. Area. **1**: 292 (1963).

Capparis falcata Loureiro, Fl. Cochinch. 331 (1790).

Crataeva falcata (Lour.) DC., l.c. 243 (1824).

Crataeva macrocarpa Kurz in Journ. Bot. **12**: 195, t. 148, f. 8–10 (1874).

Naya Bazar–Namchi, Sikkim, 1200 m (Mar. 27, 1963, fl.).

Distr. E. Himalaya, India, Burma, Thai, Indo-China, China, Formosa, Japan, Malaysia, and Polynesia.

This species is variable especially in the shape, size, and texture of leaflets and the number of flowers on racemes. Jacobs (1960) recognized three Asiatic species of *Crateva*, i.e. *C. religiosa*, *C. odora*, and *C. nurvala*, and, according to him, *C. religiosa* is characterized mainly in having generally thin-herbaceous, sessile or subsessile leaflets with fewer than 11 pairs of nerves, rachis measuring up to 10 cm long with up to 20 flowers and gynophores in fruits 6–12 cm long, papaillate. From *C. religiosa*, *C. odora* is distinguished in having firmer and smaller leaflets (5.5–10 cm long against 8.5–16 cm long of the former) with petiolules 4–5 mm long and smaller fruits 3.5–4 cm long, smooth. Our specimens from Sikkim cited above have thin-herbaceous leaflets with short petiolules (2–5 mm long), green in colour when dry, and 6–13 cm long in size. Therefore, though the collections bear no fruits, the plants seem to resemble both *C. religiosa* and *C. odora*, and it may be permissible to consider that the plants represent an intermediate between the two species. In Japan, one species of *Crateva* is found in southern Kyushu, Isl. Tanegashima, and Isl. Yakushima and it has generally been referred to *C. religiosa*. Jacobs (l.c.), however, considered the Japanese plants as *C. nurvala*, which differs from the former by its firmer, 10–15-nerved leaflets, its rachis 10–16 cm long with 20–90 flowers, and its gynophores in fruits about 5 cm long. But these two species are closely related to each other and the differences between them are not always clear, for the variation ranges both in vegetative and in floral characters of each species are considerably wide and seem to be continuous. It may, therefore, be possible to regard *C. odora* and *C. nurvala* as conspecific with *C. religiosa*.

CRASSULACEAE (by Hiroshi Hara)

Sedum himalense D. Don, Prodr. Fl. Nepal. 212 (1825)–Fl. Brit. Ind. **2**: 418 (1878)–Praeger in Journ. Roy. Hort. Soc. **46**: 51, f. 18 (1921).

S. quadrifidum Pallas var. *himalense* (D. Don) Fröderström in Act. Hort. Gothob. **5**, app.: 31 (1930).

Jongri, 4000 m (May 24, 1960, no. 442); Choktsering Chu, 4000–4500 m (May 25, 1960, fl.); Jongri–Gamothang, 3600–4200 m (May 26, 1960, fl.); Migothang, 3900 m (May 31, 1960).

Distr. E. Himalaya (Nepal, Sikkim), and W. China.

Sedum linearifolium Royle, Ill. Bot. Himal. 222, t. 48, f. 1 (1835).

var. **ovatisepalum** Raymond-Hamet in Act. Hort. Gothob. **2**: 394 (1926)–Fröderström in Act. Hort. Gothob. **5**, app.: 52 (1930). [Pl. 6 d]

S. trifidum Wallich ex Hook. f. et Thoms. in Journ. Linn. Soc. **2**: 100 (1857), p.p.–Fl. Brit. Ind. **2**: 420 (1878), p.p.–Praeger, l.c. 63, f. 25 & 26 (1921), p.p.

Phalut, 3500 m (Jun. 3, 1960, no. 637); Phalut–Sandakphu, 3300–3600 m (Jun. 6, 1930, old fr.); Chia Bhanjang–Phalut, 3100–3400 m (Jun. 2, 1960); Sandakphu–Gatribas, 3400–2800 m (Sep. 16 & 17, 1964, fl.).

Distr. E. Himalaya (Nepal to Bhutan), and S. Tibet.

Sedum multicaule Wallich ex Lindl., Bot. Reg. **1840**: Misc. 58 (1840)–Fl. Brit. Ind. **2**: 422 (1878)–Praeger, l.c. 259, f. 152 (1921)–Fröderstr., l.c. **6**, app.: 83 (1931).

Garhi Danra–Tuwa, 2200–1800 m (Nov. 4, 1963, fr.); Zongi–Iladanda, 2800–1800 m (Nov. 12, 1963, fr.); Diorali Bhanjang (Nov. 14, 1963, fr.).

Distr. Himalaya (Kashmir to Bhutan), N. Burma, and W. China.

Sedum pseudosubtile Hara in Journ. Jap. Bot. **40**: 19 (1965).

Along Preig Chu, Yoksam–Bakkim, 1800–2200 m (May 18, 1960, fl. & fr.—Typus).

Distr. E. Himalaya (Sikkim, Bhutan?).

This species belongs to Sect. Asiatica Kyphocarpa Group II Japonica Maxim. according to the classification of Fröderström (1930), and is closely allied to *S. subtile* Miquel of Japan, which flowers also in spring. It resembles *S. Triactina* Berger, but the latter has larger bracts, smaller sepals, and few-seeded three carpels.

Sedum Triactina Berger in Engl., Pfl.-fam. ed. 2, **18 a**: 460 (1930)–Fröderstr., l.c. **6**, app.: 99, t. 64, f. 2, 3 (1931).

Triactina verticillata Hook. f. et Thoms. in Journ. Linn. Soc. **2**: 103 (1858)–Fl. Brit. Ind. **2**: 423 (1878).

Thakma Khola, 3200 m (Nov. 13 & 16, 1963, fl., fr.).

Distr. E. Himalaya (Nepal, Sikkim), and W. China.

Sedum Wallichianum Hooker, Icon. Pl. t. 604 (1844).

S. crassipes Wall. ex Hook. f. et Thoms. in Journ. Linn. Soc. **2**: 99 (1858)–Praeger, l.c. 55, f. 20, 21 (1921)–Fröderstr., l.c. **5**: app. 35 (1930).

S. asiaticum (non DC. 1828) Clarke in Fl. Brit. Ind. **2**: 419 (1878), cum var. *Wallichianum* Clarke.

Jongri–Olothang, 4000–4200 m (May 23, 1960, fr.); Siling Tzokupa, 3000 m (Nov. 21, 1963, fr.).

Distr. Himalaya (Kashmir to Sikkim), Tibet, and W. China.

Some specimens from around Jongri seem to be referred to var. *Cretini* (Hamet) Hara (*S. Cretini* Hamet in Journ. Bot. **54**: suppl. 1, 16, 1916).

CRUCIFERAE (by Hiroshi Hara)

Capsella Bursa-pastoris (L.) Medikus, Pfl.-Gatt. **1**: 85 (1792)–Fl. Brit. Ind. **1**: 159 (1872).

Rimbick–Ramam, 1900–2400 m (May 7, 1960, fl. & fr.).

Distr. A cosmopolitan weed.

Cardamine circaeoides Hook. f. et Thomson in Journ. Linn. Soc. **5**: 144 (1861)–Fl. Brit. Ind. **1**: 137 (1872)–O. E. Schulz in Bot. Jahrb. **32**: 441 (1903), incl. var. *diversifolia* O. E. Schulz.

Dentam–Pamianchi, 1500–2000 m (May 12, 1960, no. 228, fl., fr.); Yoksam–Bakkim, 1700–2200 m (May 18, 1960, fl.); Gangtok (Jun. 15, 1960, fl.).

Distr. Sikkim, and W. China (Yunnan, Szechuan).

Cardamine Griffithii Hook. f. et Thomson, l.c. 146 (1861); l.c. 139 (1872)–Schulz, l.c. 505 (1903)–W. W. Smith in Rec. Bot. Surv. Ind. **4**: 351 (1913).

Nayathang-Chia Bhanjang, 3500–3200 m (June 2, 1960, ster.).

Distr. E. Himalaya (Sikkim, Bhutan), and W. China (Yunnan, Szechuan).

Cardamine impatiens L., Sp. Pl. ed. 1, **2**: 655 (1753)–Fl. Brit. Ind. **1**: 138 (1872)–Schulz, l.c. 455 (1903), incl. prol. *elongata* O. E. Schulz.

Darjeeling, 2150 m (Apr. 1, 1960, fl. & fr.).

Distr. Temperate Eurasia (from British Is. to Japan).

Cardamine macrophylla Willd., Sp. Pl. **3** (1): 484 (1800)–Fl. Brit. Ind. **1**: 139 (1872), cum 4 varr.

subsp. **polyphylla** (Don) O. E. Schulz, l.c. 401 (1903).

C. polyphylla D. Don, Prodr. Fl. Nepal. 201 (1825)–Hand.-Mzt., Symb. Sin. **7**: 358 (1931).

C. macrophylla var. *moupinensis* Franch., Fl. David. **2**: 18 (1888).

Dentaria sino-manshurica Kitagawa in Rep. Inst. Sci. Res. Manch. **4**: 111 (1940).

C. sino-manshurica Kitagawa, l.c. (1940), pro syn.

Preig Chu, 3600 m (May 23, 1960, ster.); Migothang, 3900 m (Jun. 1, 1960, ster.); Garibans–Tonglu, 2800–3000 m (Jun. 7, 1960, no. 693, fr.); Thakma Khola, 3200 m (Nov. 12, 1963).

var. **venusta** O. E. Schulz, l.c. 401 (1903), ut β prol.

Garibans–Tonglu, 2800 m (Jun. 7, 1960, fl. purple).

Distr. subsp. Himalaya (Kashmir to Sikkim), E. Tibet, W. C. & N. China, and N. Korea.

We have used young sprouts of this species as a vegetable.

Cardamine scutata Thunberg in Trans. Linn. Soc. **2**: 339 (1794).

subsp. **flexuosa** (Withering) Hara in Journ. Fac. Sci. Univ. Tokyo Bot. **6**: 59 (1952).

C. flexuosa Withering, Bot. Arr. Brit. Pl. ed. 3, **3**: 578 (1796).

C. hirsuta var. *sylvatica* Link sensu Fl. Brit. Ind. **1**: 138 (1872), p.p.

?*C. flexuosa* subsp. *debilis* (D. Don) O. E. Schulz, l.c. 478 (1903).

Senchal, 2400 m (Apr. 17, 1960, no. 1952, fl., fr.); Darjeeling, 2100 m (Apr. 1, 1960, fl., & fr); Kathmandu, 1600 m (Sep. 17 & Oct. 13, 1963, fr.) ; Dhankuta, 1200 m (Oct.

20, 1963, fr.); Sinduwa, 2100 m (Oct. 24, 1963, fr.); Helok-Baroya Khimty, 1500–2500 m (Nov. 15, 1963, fr.); Bhuspate Danra, 2800 m (Dec. 2, 1963, fl. & fr.); Mai Majuwa-Dhara Pani, 1500–1900 m (Dec. 4, 1963, fr.).

Distr. sp. Temperate Eurasia, and E. Canada.

Cardamine sikkimensis Hara in Journ. Jap. Bot. **37**: 97 (1962).

Chia Bhanjang-Dentam, ca. 2500 m (May 11, 1960, fl.--Typus); Yoksam-Bakkim, 1700–2200m (May 18, 1960, fl. & fr.); Nayathang-Chia Bhanjang, 3100–3500m (Jun. 2, 1960, fl.);

Distr. E. Himalaya (Nepal, Sikkim).

The plant may be conspecific with *Cardamine Inayatii* O. E. Schulz in Notizbl. **9**: 1069 (1927), described from Western Himalaya.

Cardamine trifoliolata Hook. f. et Thomson, l.c. 145 (1861); l.c. 138 (1872)–Schulz, l.c. 546 (1903).

Migothang-Nayathang, 3900–3300m (Jun. 1, 1960, fl.); Nayathang-Chia Bhanjang, 3200–3500 (Jun. 2, 1960, fl.); Garibans-Tonglu, 2800–3000 m (Jun. 7, 1960, fl.).

Distr. Himalaya (Kumaon (var.), Nepal, Sikkim, and Bhutan).

Draba gracillima Hook. f. et Thomson, l.c. **5**: 153 (1861)–Fl. Brit. Ind. **1**: 144 (1872)–O. E. Schulz in Pfl.-reich IV–105, Ht. **89**: 328 (1927).

Jongri-Gamothang (May 26, 1960, no. 555, fl.); Jongri, 4000 m (May 21, 23, & 24, 1960, fl.); Gamothang, 3700 m (May 27 & 29, 1960, fl., fr.); Migothang, 3900 m (May 31, 1960, no. 593, fl. yellow); Phalut, 3500 m (May 10 & Jun. 4, 1960, fl., fr.); Sandakphu-Phalut, 3300–3500 m (May 8, 1960, fl.).

Distr. Himalaya (Kumaon, Nepal, Sikkim, Bhutan).

Lepidium sativum L., Sp. Pl. ed. 1, **2**: 644 (1753)–Fl. Brit. Ind. **1**: 159 (1872).

Khebang-below Siling Tzokupa, 1700–2000 m (Nov. 20, 1963, fl., fr.); Biratnagar, 200 m (Dec. 21, 1963, fl., fr.).

Distr. N. Africa, and W. Asia. Naturalized in Europe, Tibet, and India.

Lignariella Hobsoni (Pearson) Baehni in Candollea **15**: 57, f. 1, 2 & 4 (1955); **15**: 151 (1956)–Jafri, l.c. **16**: 134, f. 16 & 18 (1957).

Cochlearia Hobsoni Pearson in Hook., Icon. Pl. t. 2643 (1900).

C.? serpens W. W. Smith in Rec. Bot. Surv. India **4**: 175 (1911).

Jongri, 4000 m (May 25, 1960, ster.); along streams at Gamothang, 3700 m (May 27 & 29, 1960, fl. purple).

Distr. E. Himalaya (Nepal, Sikkim, Bhutan), and Tibet.

Loxostemon pulchellus Hook. f. et Thomson in Journ. Linn. Soc. **5**: 147 (1861)–Fl. Brit. Ind. **1**: 139 (1872)–Hand.-Mzt., Symb. Sin. **7**: 362 (1931).

Along streams, Gamothang, 3800 m (May 27, 28 & 29, 1960, no. 535, fl. purple); Migothang, 3900 m (May 31, 1960, fl.).

Distr. E. Himalaya (Sikkim), and W. China (Yunnan).

Microsisymbrium axillare (Hook. f. et Thoms.) O. E. Schulz in Pfl.-reich IV–105, Ht. **86**: 160 (1924)–Baehni in Candollea **15**: 151 (1956).

Sisymbrium axillare Hook. f. et Thoms. in Journ. Linn. Soc. **5**: 162 (1861)–Fl. Brit. Ind. **1**: 149 (1872).

Yoksam-Bakkim, 1700–2200 m (May 18, 1960, fl., fr.).

Distr. E. Himalaya (Nepal, Sikkim, Bhutan).

Nasturtium officinale R. Brown ex Aiton, Hort. Kew. ed. 2, **4**: 109 (1812)–Fl. Brit. Ind. **1**: 133 (1872).

Rorippa Nasturtium-aquaticum (L.) Hayek, Sched. Fl. Stir. Exs. 22 (1905).

Palmajua–Rimbick, 2200–2300 m (May 5, 1960, no. 92, fl., fr.); Darjeeling (Jun. 24, 1960, fl.); Taplejung, 1700 m (Nov. 2, 1963).

Distr. Eurasia, and N. Africa; widely naturalized.

Pegaeophyton scapiflorum (Hook. f. et Thoms.) Marquand et Shaw in Journ. Linn. Soc. **48**: 229 (1929)–Hand.-Mzt., Symb. Syn. **7**: 364 (1931).

Cochlearia scapiflora Hook. f. et Thoms. in Journ. Linn. Soc. **5**: 154 (1861); Fl. Brit. Ind. **1**: 145 (1872).

Pegaeophyton scapiflorum (H. et T.) O. E. Schulz in Notizbl. **11**: 229 (1934).

In stream beds of melting snow, Oma La–Migothang, ca. 4300 m (May 30, 1960, fl. light mauve or white).

Distr. Himalaya (Kumaon, Sikkim), W. Tibet, and W. China (Yunnan, Szechuan).

Rorippa dubia (Persoon) Hara in Journ. Jap. Bot. **30**: 196 (1955).

Sisymbrium dubium Persoon, Synop. Pl. **2**: 199 (1806).

Nasturtium heterophyllum Blume, Bijdr. **2**: 50 (1825)–Miquel, Ill. Fl. Archip. Ind. **1**: 15, t. 9. (1870); non D. Don 1825.

N. indicum DC. sensu Hook. f. et Anders. in Fl. Brit. Ind. **1**: 134 (1872), p.min. p.

Rorippa indica var. *apetala* (DC.) Hochreutiner in Candollea **2**: 370 (1925).

N. sinapis O. E. Schulz in Fedde, Rep. **33**: 278 (1934), p. major. p.

Gangtok, 1650 m (Apr. 26 & Jun. 15, 1960, fl., fr.); Kathmandu, 1600 m (Oct. 13, 1963, fr.); Dhankuta, 1200 m (Oct. 20, 1963, fl., fr.).

Distr. India to Japan, south to Java; naturalized in N. & S. Americas.

DROSERACEAE (by Hiroshi Hara)

Drosera peltata Smith in Willd., Sp. Pl. **1**: 1546 (1797); Exot. Bot. t. 41 (1805)–Diels in Pfl.-reich IV–112, Ht. **26**: 110 (1906)–Fl. Camb., Laos, Vietn. **4**: 67 (1965).

var. **lunata** (Hamilt.) C. B. Clarke in Fl. Brit. Ind. **2**: 425 (1878).

Drosera lunata Hamilton in DC., Prodr. **1**: 319 (1824).

D. nipponica Masamune in Trans. Nat. Hist. Soc. Formos. **23**: 207 (1933).

D. peltata var. *nipponica* (Masam.) Ohwi, Fl. Jap. 584 (1953), comb. nud.; in Bull. Sci. Mus. Tokyo **33**: 73 (1953).

On rocky slope near Tinjuray, 2900 m (Oct. 27, 1963, fr.).

Distr. sp. Himalaya, S. Tibet, south to Ceylon, Thai, east to China, Japan, south to Malaysia, New Guinea, Australia, and Tasmania.

The Himalayan plants agree well with the Japanese ones.

PODOSTEMACEAE (by Takasi Tuyama and Hiroshi Hara)

Hydrobryum Griffithii (Wall.) Tulasne in Ann. Sci. Nat. ser. 3, **11**: 104 (1849); Monogr. Podost. 141 (1852)–Fl. Brit. Ind. **5**: 64 (1890)–Willis in Ann. Bot. Gard. Perad. **1**: 238 (1902); **2**: 394, t. 36, f. 6–8 (1902)–Tuyama et Hara in Journ. Jap. Bot. **39**: 185, f. 1–2, t. 6 (1964)–Royen in Dansk Bot. Ark. **23**: 185 (1965). [Pl. 5 c]

Podostemon Griffithii Wallich ex Griffith in Asiat. Research. **19**: 105, t. 17 (1836); Icon. Pl. Asia. t. 541, f. II; t. 544 (1854).

On wet rocks in a small stream near Linkhim, north of Taplejung, 1800 m (Nov. 4, 1963, fl., fr.); near Chyangthaphu, 1050 m (Nov. 27, 1963).

Distr. Himalaya (Nepal), N. Assam, Khasia, Manipur, N. Thai, and Tonkin.

This is an interesting addition to the flora of East Nepal. A closely allied species, *H. japonicum* Imamura (1929), occurs in the southern part of Kyushu, and differs from the Himalayan species in the shape of stigmas.

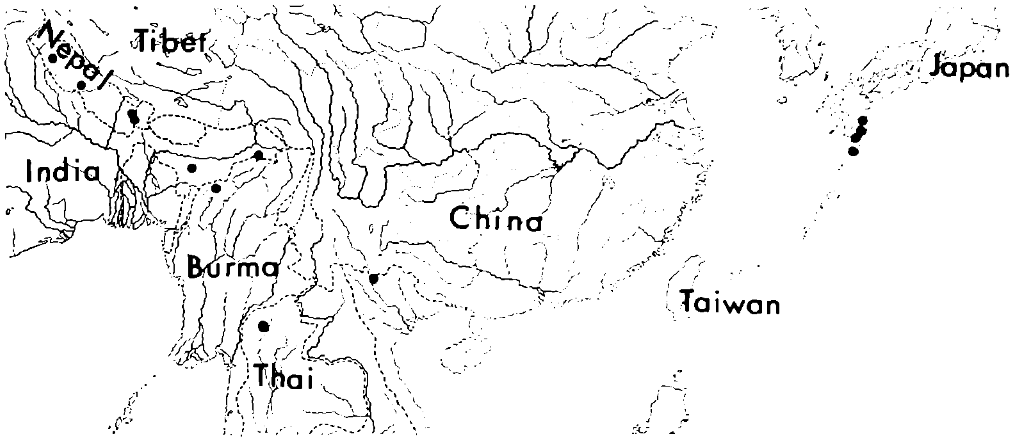

Fig. 15. Distribution map of the genus *Hydrobryum*.

SAXIFRAGACEAE (by Hiroshi Hara)

Astilbe rivularis Hamilton in D. Don, Prodr. Fl. Nepal. 211 (1825)–Fl. Brit. Ind. **2**: 389 (1878)–Fl. Camb., Laos, Vietn. **4**: 9 (1965).

Darjeeling, 2100 m (Apr. 5, 1960, fr. annot.); Senchal, 2350 m (Sep. 19, 1964, fl.); Senchal–Takdah (Apr. 17, 1960, fr. annot.); Batasi–Palmajua, 2300–2600 m (May 3, 1960, fr. annot.); Rabong La–Temi, lower road, 1200 m (Mar. 28, 1963, fr. annot.); Kakani, near Kathmandu, 2100 m (Sep. 24, 1963, fr.); Murhay, 2100 m (Oct. 22, 1963, fl.); Sinduwa, 2100 m (Oct. 24, 1963, fr.); Bilbatay Bhanjang, 2200 m (Oct. 25, 1963, fr.); Iladanda–Selap (Nov. 9, 1963, fr.); Helok–Lelep, 2400 m (Nov. 9, 1963, fr.); Baroya Khimty–Thakma Khola, 2500 m (Nov. 12 & 17, 1963, fl., fr.); Siling Tzokupa (Nov. 21, 1963, fr.); Lagyap, 2200 m (Sep. 13, 1964, fl.).

Distr. Himalaya (Kashmir to NEFA), Khasia, Manipur, Thai, Tonkin, and W. China (Yunnan).

Bergenia purpurascens (Hook. f. et Thoms.) Engler in Bot. Zeit. **26**: 841 (1868); in Verh. Zool. Bot. Ges. Wien **19**: 549 (1869)–Spring Fl. Sikkim Himal. f. 9 (1963)–Yeo in Kew Bull. **20**: 123 (1966).

Saxifraga purpurascens Hooker f. et Thomson in Journ. Linn. Soc. **2**: 61 (1857)–Bot. Mag. t. 5066 (1858)–Fl. Brit. Ind. **2**: 398 (1878).

Jongri, 4100m (May 23, 1960, no. 451, fl.); along Choktsering Chu, north of Jongri, 4000–4500 m (May 25, 1960, fl.) ; Jongri–Gamothang, 3900–4200 m (May 26, 1960, fl., fr.); Gamothang, 3750 m (May 29, 1960, fl.); Migothang–Nayathang, 3900–3300m (Jun. 1, 1960, fl.); Nayathang–Chia Bhanjang, 3300–3500 m (Jun. 2, 1960, fl.).

Distr. E. Himalaya (Nepal to N. Assam), S. E. Tibet, N. Burma, and W. China.

Chrysosplenium carnosum Hooker f. et Thomson in Journ. Linn. Soc. 2: 73 (1857)–Fl. Brit. Ind. 2: 400 (1878)–Hara in Journ. Fac. Sci. Univ. Tokyo Bot. 7: 59, f. 12 D (1957).

Below Panding, Jongri–Gamothang, 4200 m (May 26, 1960, no. 508, fl.); Gamothang, 3800 m (May 27, 1960, fl.); Gamothang–Migothang, 3800–4400 m (May 30, 1960, no. 576, fl.).

Distr. Himalaya (Garhwal to Sikkim), S. Tibet, and Sikang.

Our collection, no. 508, is a dwarf form, and somewhat resembles *C. sikangense* Hara (placed in Ser. Flagellifera) which seems better to be moved near to *C. carnosum* of Ser. Ovalifolia.

Chrysosplenium lanuginosum Hooker f. et Thomson in Journ. Linn. Soc. 2: 74 (1857)–Fl. Brit. Ind. 2: 401 (1878)–Hara, l.c. 80, f. 16 A (1957).

Batasi–Palmajua, 2300–2500 m (May 3, 1960, no. 78, fl.); Palmajua–Rimbick (May 5, 1960, fl.); Jongri–Gamothang, 4200–3600 m (May 26, 1960, fl., fr.); Nayathang–Chia Bhanjang, 3200 m (Jun. 2, 1960, fl.); Garibans–Tonglu, 2800m (Jun. 7, 1960, fr.); Lam Pokhari, 2900 m (Oct. 28, 1963); Minchin Dhap–Mul Pokhari, 2900–2500 m (Oct. 29, 1963); Thakma Khola, 3000 m (Nov. 12, 1963); Bhuspate Danra, 2900 m (Dec. 1 & 2, 1963).

Distr. E. Himalaya (Nepal to Bhutan), Manipur, N. Burma, and W. China.

Chrysosplenium nepalense D. Don, Prodr. Fl. Nepal. 210 (1825)–Fl. Brit. Ind. 2: 400 (1878)–Hara, l.c. 29, f. 5 F (1957).

Victoria Fall, Darjeeling, 1950 m (Apr. 3, 1960); Ghum, 2300 m (Apr. 4, 1960, fl.); Senchal, 2400 m (Apr. 6, 1960, fl.; Jun. 23, 1960); Kurseong, 1550 m (Apr. 12, 1960, no. 784, fl.); Batasi, 2000 m (May 2, 1960, no. 16, fl., fr.); Palmajua–Rimbick, 1400–2300m (May 5, 1960, fr.); Sandakphu–Phalut, 3300–3600m (May 8, 1960, fl.); Bakkim–Jongri, 2500–4000m (May 19, 1960, fl.); Preig Chu, Jongri–Olothang, 3600m (May 23, 1960, fl.); Gamothang, 3800m (May 29, 1960, no. 548, fl.); Migothang, 3900m (May 31, 1960); Nayathang–Phalut, 3100–3500 m (Jun. 2, 1960, fl.); Migothang–Nayathang, 3900–3300 m (Jun. 1, 1960, no. 712 & 715, fl.); Penlong La, Gangtok, 2100m (Jun. 16, 1960; Mar. 18, 1963); Damthang, 2100–2200 m (Mar. 25, 1963, fl.); Murhay, Dhankuta, 2100 m (Oct. 23, 1963); Bilbatay Bhanjang–Hati Sar, 2200–2900m (Oct. 27, 1963).

Distr. Himalaya (Nepal to NEFA), Manipur, S. Tibet, N. Burma, and W. China (Yunnan, Szechuan).

Our collections are variable especially in size. Extreme dwarf forms as represented by our three specimens are collected in alpine regions. They have stems only 1–4 cm high, small leaves 1–3 mm long with fewer teeth, and 1–5-flowered cymes.

The species clearly differs from *Chr. Grayanum* Maxim. of Japan by broader roundish ovate leaves, spreading ovate sepals, 8 longer stamens, reddish anthers, prominent disk, and smooth seeds.

Chrysosplenium nudicaule Bunge in Ledeb., Fl. Altai 2: 114 (1830); Icon. Fl. Ross. 5: t. 405 (1834)–Fl. URSS. 9: 202, t. 12, f. 2 (1939)–Hara in Journ. Fac. Sci. Univ. Tokyo Bot. 7: 64, f. 13 A (1957).

var. **intermedium** Hara, l.c. 65, f. 13 A′ (1957)–Spring Fl. Sikkim Himal. f. 8 (1963).

C. alternifolium L. sensu Fl. Brit. Ind. **2**: 400 (1878), p.p.

C. alternifolium var. *sibiricum* Seringe sensu Hara, l.c. 72 (1957), quoad pl. ex Nepal.

By Preig Chu, between Jongri & Olothang, 3600 m (May 23, 1960, no. 476, fl.); Oma La–Migothang, 4100–3900 m (May 30, 1960, no. 582, fl.); near Migothang, 3900 m (May 31, 1960, fl.).

Distr. sp. Altai, Sajan, Tian-Shan, Pamir, Himalaya (Nepal to Bhutan), S. Tibet, and W. China (Kansu, Yunnan, Szechuan).

In Eastern Himalaya, the *C. alternifolium* group is variable showing some intermediate characters between *C. nudicaule*, *C. Forrestii*, and *C. alternifolium* var. *sibiricum*. In the shape of leaves our plants resemble *C. alternifolium* var. *sibiricum*, but are glabrous and have thicker rhizomes clothed with old petiole-bases, thick roots, dark green thicker leaves, campanulate flowers, longer filaments 0.7–1 mm long, and a half-superior ovary. Thus they are closely allied to *C. nudicaule*, but have sometimes 1–2 cauline leaves, smaller flowers, and shorter flattish teeth of leaves.

The plants found in sunny places near Migothang are small and 2–5 cm high, and their flowers and bracteal leaves are bright yellow or greenish yellow. Larger plants collected below Migothang, however, attain 15 cm high with larger bracteal leaves 2 cm across, and rather agree with *C. Forrestii* Diels. The plants growing on mossy rocks in forests along the Preig Chu below Jongri are medium in size attaining 8–15 cm high, and have more greenish bracteal leaves. Considering a wide range of variations in our collections, *C. Forrestii* may be regarded as conspecific with *C. nudicaule*.

Chrysosplenium singalilense Hara in Journ. Jap. Bot. **36**: 77 (1961). [Fig. 16]

On mossy rocks, Phalut, 3500 m (Jun. 4, 1960, no. 764 p.p., fl. & fr.—Typus).

Endemic. The species is closely allied to *Chr. microspermum* Franchet of central China.

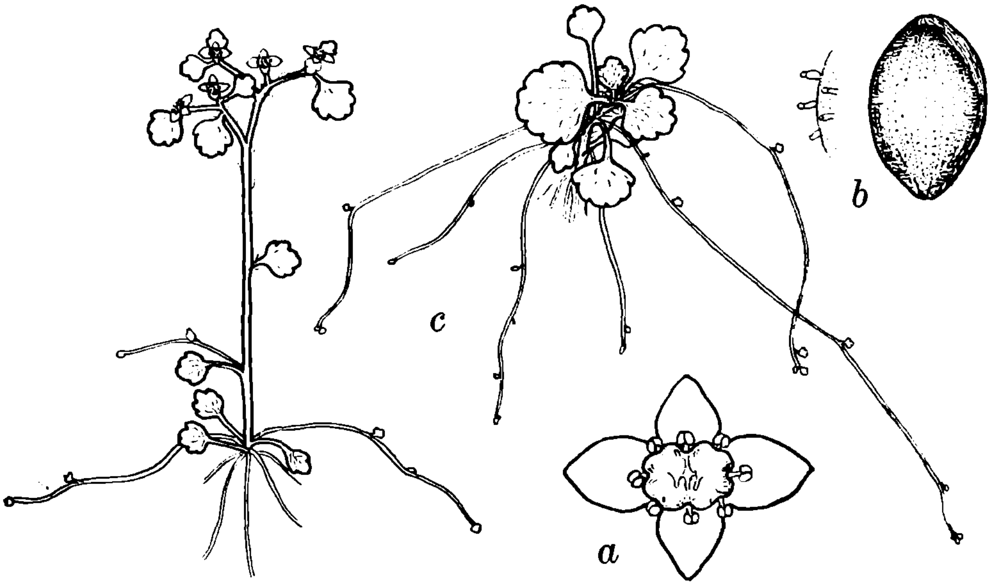

Fig. 16. *Chrysosplenium singalilense* Hara, ×1.
a. Flower, ×6. b. Seed, ×40. c. Developed sterile branches, ×1.

Deutzia crenata Sieb. et Zucc., Fl. Jap. **1**: 19, t. 6 (1835).

f. **candidissima** (Bonard) Hara in Journ. Jap. Bot. **32**: 137 (1957).

Darjeeling, cult., 2100 m (Jun. 19, 1960, fl.).

Distr. sp. Japan.

Deutzia Hookeriana (Schneid.) Airy-Shaw in Kew Bull. **1934**: 180 (1934)-Zaikonnikova in Bot. Journ. USSR. **47**: 210 (1962).

D. corymbosa Br. sensu Fl. Brit. Ind. **2**: 406 (1878), p.p.

D. corymbosa var. *Hookeriana* Schneid. in Mitt. Deuts. Dendr. Ges. **13**: 184 (1904).

Iladanda–Selap, 1800–2600 m (Nov. 9, 1963, fr.); Thakma Khola, 3000 m (Nov. 12, 1963).

Distr. Himalaya (Nepal to Bhutan), N. Burma, S. E. Tibet, and W. China (Yunnan).

Deutzia staminea R. Brown ex Wallich, Pl. Asia. Rar. **2**: 82, t. 191 (1831)-Fl. Brit. Ind. **2**: 407 (1878)-Rehder, Bibl. 198 (1949).

Taplethok–Helok, 1400–1600 m (Nov. 6, 1963, fr.); Iladanda–Selap, 1800–2600 m (Nov. 9, 1963, fr.).

Distr. Himalaya (Kashmir to Sikkim).

Dichroa febrifuga Loureiro, Fl. Cochinch. **1**: 301 (1790)-Fl. Brit. Ind. **2**: 206 (1878)-Chun in Act. Phytotax. Sin. **3**: 117, t. 25 (1954)-Spring Fl. Sikkim Himal. f. 150 (1963)-Fl. Camb., Laos, Vietn. **4**: 30 (1965).

Adamia cyanea Wallich, Tent. Fl. Napal. **2**: 46, t. 36 (1826); Pl. Asia. Rar. **3**: t. 213 (1832)-Bot. Mag. t. 3046 (1831).

Darjeeling, 2100 m (Apr. 1 & 14, 1960, fr.); Palmajua–Rimbick (May 5, 1960, fl.); Rimbick–Ramam, 1900–2400 m (May 7, 1960); Pamianchi–Tingling Bridge, 2000–1000 m (May 15, 1960, no. 273, fl.); Penlong La, Gangtok, 2100 m (Jun. 16, 1960, fl.); Ghum– Kurseong (Jun. 22, 1960, fl.).

Distr. Himalaya, N. Assam, Manipur, Burma, Thai, Indo-China, Malaysia, and C. & S. China.

Hydrangea anomala D. Don, Prodr. Fl. Nepal. 211 (1825)-McClintock in Proc. Calif. Acad. Sci. **29**: 196, map 5 (1957), subsp. *anomala*.

H. altissima Wallich, Tent. Fl. Napal. **2**: t. 50 (1826)-Fl. Brit. Ind. **2**: 404 (1878).

H. glabra Hayata in Journ. Coll. Sci. Univ. Tokyo **25** (19): 89, t. 6 (1908).

Darjeeling, 2100 m (Apr. 2, 1960); Batasi–Palmajua, 2300–2600 m (May 3, 1960, fl.); Dentam–Pamianchi, 1500–2000 m (May 12, 1960, fl.); below Bakkim by the Preig Chu, 2200 m (May 19, 1960, no. 428, fl.); Tendong Peak, 2700 m (Mar. 26, 1963, bud); Helok–Iladanda (Nov. 8, 1963); Chyangthaphu (Nov. 27, 1963, fr.).

Distr. Himalaya (Garhwal to Bhutan), N. Assam, N. Burma, W. & C. China, and Formosa.

Regarding the relationship with the Japanese plants, see page 636.

Hydrangea heteromalla D. Don, Prodr. Fl. Nepal. 211 (1825)-McClintock, l.c. 214, map 7 (1957).

H. vestita Wallich, Tent. Fl. Napal. **2**: t. 49, excl. fig. 5–8 (1826)-Fl. Brit. Ind. **2**: 405 (1878).

Garibans–Tonglu, ca. 2800 (Jun. 7, 1960, bud; Sep. 17, 1964, fr.); Hati Sar–Minchin Dhap, 2800 m (Oct. 28, 1963, fr.); Siling Tzokupa, 3000 m (Nov. 21, 1963, fr.).

Distr. Himalaya (Garhwal to NEFA), Assam, S. Tibet, N. Burma, Tonkin, and W., C. & N. China (north to Hopeh, Chahar, Jehol).

Hydrangea robusta Hook. f. et Thomson in Journ. Linn. Soc. **2**: 76 (1858)–Fl. Brit. Ind. **2**: 404 (1878).

H. Kawakamii Hayata in Journ. Coll. Sci. Univ. Tokyo **25** (19): 90 (1908), e typo.

H. aspera D. Don subsp. *robusta* (Hook. f. et Thoms.) McClintock in Journ. Arn. Arb. **37**: 373 (1956); in Proc. Calif. Acad. Sci. **29**: 194 (1957).

Darjeeling, 2100 m (Apr. 2 & Jun. 24, 1960, fr. annot.); Birch Hill, 2000 m (Jun. 11, 1960, fr. annot.); Palmajua–Rimbick, 1400–2300 m (May 5, 1960, fr. annot.); Ghum–Kurseong, 2200–1600 m (Jun. 22, 1960, bud); Damthang–Temi, 2100 m (Mar. 25, 1963, fr. annot.); Yektin–Akasay, 1500–2300 m (Nov. 30, 1963, fr.); Mai Majuwa–Dhara Pani (Dec. 4, 1963, fr.).

Distr. Himalaya (Garhwal to Bhutan), E. Tibet, N. Burma, Tonkin, W. & C. China, and Formosa.

Parnassia mysorensis Heyne ex Wight et Arnott, Prodr. Fl. Ind. Or. **1**: 35 (1834)–Fl. Brit. Ind. **2**: 402 (1879)–Nekrassova in Bull. Soc. Bot. France **74**: 648 (1927).

P. affinis Hook. f. et Thoms. in Journ. Linn. Soc. **2**: 81 (1858), fide Nekrassova.

Sandakphu, 3600 m (Sep. 16, 1964, fl. & fr.).

Distr. India (Sikkim, Khasia, Mysore), SE. Tibet, and W. China.

Parnassia nubicola Wallich ex Royle, Ill. Himal, Pl. 227, t. 50, f. 3 (1835)–Wight, Ill. Ind. Bot. **1**: 45, t. 21, C (1840)–Fl. Brit. Ind. **2**: 402 (1878)–Bot. Mag. t. 6609 (1882).

Phalut, 3500 m (Jun. 4 & 5, 1960, ster.).

Distr. NE. Afghanistan, and Himalaya (Kashmir to Bhutan).

Philadelphus tomentosus Wallich ex G. Don, Gen. Hist. **2**: 807 (1832)–S.-Y. Hu in Journ. Arn. Arb. **36**: 88 (1955).

P. coronarius var. *tomentosus* Hook. f. et Thoms. in Journ. Linn. Soc. **2**: 83 (1857)–Fl. Brit. Ind. **2**: 407 (1878).

Iladanda–Selap, 1800–2600 m (Nov. 9, 1963, fr.); Walunchung Gola–Zongi, 3800–2800 m (Nov. 11, 1963, fr.).

Distr. Himalaya (Kashmir to Bhutan).

Ribes acuminatum Wallich [in Roxb., Fl. Ind. ed. Carey, **2**: 514 in nota (1824), nom. provis.] ex G. Don, Gen. Hist. **3**: 187 (1834)–Janczewski, Monogr. Groseill. 470 (1907), *β. maius* Jancz.

R. glaciale Wallich, l.c. 513 (1824), p.p.–Fl. Brit. Ind. **2**: 410 (1878), p.p.

Batasi–Palmajua, 2300–2600 m (May 3, 1960, no. 64, young fr.); Bakkim–Jongri, 2500–4000m (May 19, 1960, late fl.); Chia Bhanjang–Dentam, 3100–2700 m (May 11, 1960, no. 175, fl. & young fr.); Garibans–Tonglu, 2800–3000m (Jun. 7, 1960, no. 684, late fl.); above Tutay, 2400 m (Oct. 26, 1963); Baroya Khimty–Thakma Khola (Nov. 12 & 16, 1963).

Distr. Himalaya, Assam, Burma, and W. & C. China (Yunnan to Hupeh).

The name *R. acuminatum* was validated by G. Don, and it is typified by the specimen of Sirmore in the Wallich Herbarium (Cat. no. 6834 A). This species is usually epiphytic, and its leaves are larger with an elongate broad middle lobe (cf. a note under *R. glaciale*).

Ribes glaciale Wallich in Roxb., Fl. Ind. ed. Carey, **2**: 513 (1824), p.p.-Fl. Brit. Ind. **2**: 410 (1878), p.p.-Janczewski, Monogr. Groseill. 467, f. 173 (1907)-Rehder, Man. ed. 2, 296 (1940); Bibl. 206 (1949).

var. **laciniatum** (Hook. f. et Thoms.) Clarke in Fl. Brit. Ind. **2**: 410 (1878).

Ribes laciniatum Hook. f. et Thomson in Journ. Linn. Soc. **2**: 87 (1857)-Janczewski, l.c. 466, f. 172 ((1907).

Sandakphu-Phalut, 3300-3600 m (May 8, 1960, fl.); Phalut-Chia Bhanjang, 3600-3100 m (May 11, 1960, no. 244, no. 194, fl.); Bakkim-Jongri, 2500-4000 m (May 19, 1960, no. 365, fl. ♂); Jongri, 4000-4200 m (May 21, 1960, fl. ♂); Jongri-Gamothang, 4200-3600 m (May 26, 1960, no. 504, fl.); Nayathang-Phalut (Jun. 2, 1960, young fr.); Minchin Dhap-Mul Pokhari (Oct. 29, 1963).

Distr. Himalaya (Kashmir to Bhutan), S. Tibet, N. Burma, and W. & C. China.

Wallich at first confounded two plants under his *R. glaciale*. By the suggestion of Govan, Wallich has already noted in 1824 that, if the species is confirmed to include two species, he may call the one with large leaves as *R. acuminatum*. So the name *R. glaciale* should be retained for the other element with small leaves. The sheet of *R. glaciale* Wallich (Cat. no. 3833) in the Wallich Herbarium at Kew collected ' ad Gossain Than ' is a mixture, but two flowering branches on the sheet with small leaves are regarded as the type. The type has inflorescences without stipitate glands, and calyx-lobes obtuse at the tip. While, in our specimens, the rachis of inflorescences is always glandular hairy, and the calyx-lobes are acute at the apex (cf. a note under *R. acuminatum*).

Ribes Griffithii Hooker f. et Thomson in Journ. Linn. Soc. **2**: 88 (1857)-Fl. Brit. Ind. **2**: 411 (1878)-Janczewski, l.c. 302, f. 39 (1907).

Garibans-Tonglu, 2800-3000 m (Jun. 7, 1960, young fr.).

Distr. E. Himalaya (Nepal to Bhutan), Assam, and S. Tibet.

Ribes luridum Hooker f. et Thomson, l.c. 87 (1857)-Fl. Brit. Ind. **2**: 410 (1878)-Janczewski, l.c. 469, f. 174 & 175 (1907).

Gamothang, 3800 m (May 29, 1960, fl. ♀).

Distr. E. Himalaya (Sikkim, Nepal), E. Tibet, and W. & C. China.

Saxifraga brachypoda D. Don in Trans. Linn. Soc. **13**: 378 (1821)-Sternberg, Rev. Saxif. Suppl. **2**: 22, t. 24 (1831)-Fl. Brit. Ind. **2**: 396 (1878)-Engl. et Irmsch. in Pfl.-reich IV-117-1, Ht. **67**: 136 (1916).

Jongri, ca. 4000 m (May 23, 1960, fr. annot.); Tinjuray, 3000 m (Oct. 27, 1963, fl.); Hati Sar-Minchin Dhap, 2900 m (Oct. 28, 1963, fl.); Michin Dhap-Mul Pokhari (Oct. 29, 1963, fl.); Halhale Bhanjang, 2800 m (Dec. 1, 1963, fl.); Sandakphu, 3600 m (Sep. 17, 1964, fl.).

Distr. Himalaya (Garhwal to Bhutan), Naga Hills, N. Burma, S. Tibet, and Yunnan.

Saxifraga cordigera Hooker f. et Thomson, l.c. **2** : 68 (1857)-Fl. Brit. Ind. **2**: 391 (1878)-Engl. et Irmsch., l.c. 125, f. 26, L-U (1916).

Jongri-Olothang, 3900-4000 m (May 23, 1960, fr. annotin.) ; Jongri-Gamothang, 3600-4200 m ((May 26, 1960, fr. annotin.).

Distr. E. Himalaya (Nepal, Sikkim), and S. Tibet.

Saxifraga diversifolia Wallich ex Seringe in DC., Prodr. **4**: 44 (1830)-Fl.

Brit. Ind. **2**: 393 (1879), p.p.–Engl. et Irmsch., l.c. 127 (1916).

Kala Pokhari–Sandakphu, 3400–3600 m (Sep. 16, 1964, fl.).

Distr. Himalaya (Kashmir to Bhutan), Assam, N. Burma, and W. China.

If the species is interpreted in a wide sense to include var. *parnassifolia*, the correct name for the species becomes *Saxifraga parnassifolia* D. Don in Trans. Linn. Soc. **13**: 405 (1821).

Saxifraga hispidula D. Don in Trans. Linn. Soc. **13**: 380 (1821)–Fl. Brit. Ind. **2**: 396 (1879)–Engl. et Irmsch., l.c. 135 (1916).

Sandakphu, 3600 m (Sep. 17, 1964, defl.).

Distr. Himalaya (Nepal to Bhutan), S. Tibet, N. Burma. and W. China.

Saxifraga latiflora Hooker f. et Thomson, l.c. **2**: 71 (1857)–Fl. Brit. Ind. **2**: 392 (1878)– Engl. et Irmsch., l.c. 101 (1916).

Migothang, 3900–4000 m (May 31, 1960, fr. annotin.).

Distr. E. Himalaya (Sikkim, and Bhutan).

Saxifraga Moorkroftiana Wallich ex Sternberg, Rev. Saxif. Suppl. **2**: 28, t. 24 (1831)–Engl. et Irmsch., l.c. 100 (1916).

S. diversifolia Wall. γ. *Moorkroftiana* Seringe in DC., Prodr. **4**: 44 (1830).

S. lysimachioides Klotzsch, Bot. Erg. t. 42 (1862).

Jongri, 4000–4200 m (May 21, 1960, infl. annotin.); Jongri–Olothang, 3900–4000 m (May 23, 1960, no. 454, fr. annotin.).

Distr. Himalaya (Kashmir to Sikkim), S. Tibet, and W. China (Yunnan).

Saxifraga strigosa Wallich ex Seringe in DC., Prodr. **4**: 41 (1830)–Sternb., Rev. Saxifr. Suppl. **2**: 14, t. 22 (1831)–Fl. Brit. Ind. **2**: 393 (1878)–Engl. et Irmsch., l.c. 137 (1916).

Phalut–Sandakphu, 3500 m (Jun. 6, 1960, ster.).

Distr. Himalaya (Kumaon to Bhutan), and W. China (Yunnan, Szechuan).

Tiarella polyphylla D. Don, Prodr. Fl. Nepal. 210 (1825)–Fl. Brit. Ind. **2**: 399 (1878)–Hooker, Icon. Pl. **16**: t. 1584 (1887)–Hara in Nova Fl. Jap. **3**: 118, f. 32 (1939).

Batasi–Palmajua, 2100–2300 m (May 3, 1960, no. 70, fl., fr.); Rimbick–Ramam, 1900–2400 m (May 7, 1960, fl., fr.); Chia Bhanjang–Dentam, 2500 m (May 11, 1960, fl.); Garibans–Tonglu, 2800–3000 m (Jun. 7, 1960, fl., fr.); Bilbatay Bhanjang–Hati Sar, 2200–2900 m (Oct. 27, 1963, fr.); Minchin Dhap–Mul Pokhari, 2900–2500 m (Oct. 29, 1963, fr.); Zongi—Iladanda, 1800–2800 m (Nov. 12, 1963, fr.); Bhuspate Danra, 2900 m (Dec. 2, 1963, fr.).

Distr. E. Himalaya (Nepal to Bhutan), E. Tibet, W. & C. China, Formosa, and Japan (Hokkaido to Shikoku).

PITTOSPORACEAE (by Hiroshi Hara)

Pittosporum napaulense (DC.) Rehder et Wilson in Pl. Wilson. **3**: 326 (1916), ut *napaulensis*–Gowda in Journ. Arn. Arb. **32**: 330 (1951).

Senacia napaulensis DC., Prodr. **1**: 347 (1824).

Pittosporum floribundum Wight et Arnott sensu Fl. Brit. Ind. **1**: 199 (1872), p.p.

Rabong La–Temi, lower road, 1200 m (Mar. 28, 1963, fl. fragrant); Kathmandu, 1500 m (Dec. 27, 1963, fr.).

Distr. sp. Himalaya (Punjab to Bhutan), Khasia, and S. Tibet.

The hairs on inflorescences are white when fresh, and are not brown, as Gowda has stated.

HAMAMELIDACEAE (by Hiroshi Hara)

Symingtonia populnea (R. Br. ex Griff.) van Steenis in Act. Bot. Neerl. **1**: 444 (1952)–Fl. Males. **5**: 375 (1957)–Fl. Camb., Laos, Vietn. **4**: 83 (1965).

Bucklandia populnea R. Brown ex Griffith in Asiat. Research **19**: 95, t. 13 & 14 (1836)–Fl. Brit. Ind. **2**: 429 (1878)–Bot. Mag. t. 6507 (1880).

Takdah, 1600 m (Apr. 18, 1960, no. 2108, fr.); Batasi, 2000 m (May 2, 1960, fr.); Dentam–Pamianchi, 1400–2000 m (May 12, 1960, fr.); Penlong La, 2100 m (Jun. 16, 1960); above Helok, 1600 m (Nov. 9, 1963); Chyangthaphu–Birwa, 1300–2400m (Nov. 27, 1963); Khunga, 2000 m (Nov. 28, 1963).

Distr. E. Himalaya (Nepal to Bhutan), Assam, Manipur, N. Burma, Thai, Tonkin, W. China (Yunnan, Kweichow), Malay, and S. Sumatra.

ROSACEAE (by Hiroshi Hara and Hiroyoshi Ohashi, *Potentilla* by Gen Murata)

Acomastylis elata (Wall.) F. Bolle in Fedde, Rep. Beih. **72**: 83 (1933).

Geum elatum Wallich [Cat. no. 711 (1828), nom. nud.] ex Hook. f., Fl. Brit. Ind. **2**: 343 (1878)–Evans in Not. Bot. Gard. Edinb. **14**: 27, t. 195 (1923), var. *typicum* Evans.

Sieversia elata (Wall.) Royle, Ill. Himal. Pl. 207, t. 39, f. 1 (1835).

Gamothang–Migothang, 4000 m (May 30, 1960, no. 586, fl.); Migothang, 3900 m (May 31, 1960, bud).

Distr. Himalaya (Kashmir to Sikkim), and Tibet.

In general appearance, our specimens are near to var. *humile*, but the carpels are densely pubescent, and the styles are hairy in the lower part in most of them, while the pubescence is not so dense in a few others.

Acomastylis sikkimensis (Prain) F. Bolle in Fedde, Rep. Beih. **72**: 83 (1933).

Geum sikkimense Prain in Journ. Asia. Soc. Bengal **73** (2): 200, t. 7 (1904)–Evans, l.c. 27 (1923).

Below Phalut, 3500m (Jun. 5, 1960, no. 653, fl.); Nayathang–Chia Bhanjang, 3300m (Jun. 2, 1960, bud).

Distr. The Singalila Range.

Agrimonia pilosa Ledebour in Ind. Sem. Hort. Dorpat. Suppl. 1 (1823)–Nakai in Bot. Mag. Tokyo **47**: 244 (1933).

var. **nepalensis** (D. Don) Nakai, l.c. 247 (1933)–Kitamura, Faun. & Fl. Nepal Himal. 147 (1955).

A. nepalensis D. Don, Prodr. Fl. Nepal. 229 (1825).

A. Eupatorium L. sensu Fl. Brit. Ind. **2**: 361 (1878), p.p.

Godavari, Kathmandu, 1500 m (Sep. 18, 1963, fl., fr.); Gokarna Forest, 1400 m (Sep. 22, 1963); Dhankuta, 1200 m (Oct. 18 & 19, 1963, fl., fr.); Sinduwa, 2100 m (Oct. 23, 1963, fl.); below Siling Tzokupa (Nov. 21, 1963, fl.); Mai Majuwa–Dhara Pani, 1900–1500 m (Dec. 4, 1963, fr.).

Distr. Himalaya (Kashmir to Sikkim), Khasia, S. Tibet, Burma, Indo-China, and China.

See a note on page 636.

Aruncus dioicus (Walter) Fernald in Rhodora **41**: 423 (1939)–Hara in Journ. Jap. Bot. **30**: 67 (1955).

Spiraea Aruncus L., Sp. Pl. ed. 1, **1**: 490 (1753).

Actaea dioica Walter, Fl. Carol. 152 (1788).

Aruncus silvester Kosteletzky [Ind. Pl. Hort. Prag. 15 (1844), nom. nud.] ex Maxim. in Act. Hort. Petrop. **6**: 169 (1879).

var. **triternatus** (Maxim.) Hara, l.c. 68 (1955).

Spiraea triternata Wallich, Cat. no. 706 (1829), nom. nud.

Spiraea Aruncus L. sensu Fl. Brit. Ind. **2**: 323 (1878).

Aruncus sylvester δ. triternata (Wall.) Maxim., l.c. 171 (1879).

Migothang–Nayathang, 3900–3300 m (Jun. 1, 1960, bud); Phalut, 3500 m (Jun. 4, 1960, bud); Garibans–Tonglu, 2800 m (Jun. 7, 1960, fl.); Kala Pokhari–Sandakphu, 3000–3600 m (Sep. 16, 1964, fr.).

Distr. var. Himalaya (Simla to Sikkim). sp. C. Europe, Caucasus, E. Siberia, China, Korea, Japan, and N. America.

The geographical variations of this widespread species were discussed by Hara, l.c. 65–69 (1955).

Cotoneaster acuminatus Lindley in Trans. Linn. Soc. **13**: 101, t. 9 (1821)–Hook. f., Fl. Brit. Ind. **2**: 385 (1878)–Yü in Bull. Brit. Mus. **1**: 132 (1954)–Klotz in Wiss. Zeits. Univ. Halle, Math.-Nat. **6**: 948 (1957).

Bilbatay Bhanjang–Hati Sar, 2800 m (Oct. 27, 1963, fr.); Selap–Walunchung Gola, 3700 m (Nov. 10, 1963, fr.); Walunchung Gola–Zongi (Nov. 11, 1963, fr.).

Distr. Himalaya (Simla to Sikkim), and W. China (Yunnan).

Cotoneaster adpressus Bois in Vilmorin et Bois, Frutic. Vilmor. 116 (1904); in Fedde, Rep. **3**: 226 (1906)–Rehd. et Wils. in Pl. Wilson. **1**: 155 (1912)–Klotz, l.c. 949 (1957).

C. horizontalis var. *adpressus* (Bois) Schneider, Ill. Handb. Laubh. **1**: 745 (1906)–Yü, l.c. 131 (1954).

Jongri–Olothang, 3900 m (May 23, 1960, no. 231, fl.).

Distr. Himalaya (Nepal, Sikkim), Burma, and W. China.

Cotoneaster congestus Baker in Saunders, Refug. Bot. **1**: t. 51 (1869)–Klotz, l.c. **6**: 953 (1957) et **12**: 780 (1963).

C. microphylla var. *glacialis* Hooker f. ex Wenzig in Linnaea **38**: 195 (1874)–Hook, f., l.c. 387 (1878)–Yü, l.c. 135 (1954).

C. microphyllus Wallich ex Lindley sensu Yü, l.c. 134 (1954), p.p.

Ramam–Phalut, 2400–3500 m (May 9, 1960, no. 161, fl.); Chia Bhanjang–Phalut, 3200 m (Jun. 2, 1960, fl.); Nayathang–Phalut, 3100 m (Jun. 2, 1960, nos. 761 & 762, fl.); Selap–Walunchung Gola, 3600 m (Nov. 10, 1963, fr.); Siling Tzokupa, 3500 m (Nov. 21, 1963, fr.); Tonglu–Garibans, 2800–3000 m (Sep. 16, 1964, fr.).

Distr. E. Himalaya (Nepal to Bhutan), and S. Tibet.

Cotoneaster microphyllus Wallich ex Lindley in Bot. Reg. **13**: t. 1114 (1827) et **15**: in nota sub t. 1229 (1829)–Hook. f., l.c. 387 (1878)–Hurusawa in Act. Phytotax. Geobot. **13**: 232 (1943)–Yü, l.c. 134 (1954)–Klotz, l.c. **6**: 963 (1957) et **12**: 779 (1963).

Sinduwa, Dhankuta Dist., 2100 m (Oct. 23, & 24, 1963, fr.); Selap–Walunchung Gola (Nov. 10, 1963, fr.); Thakma Khola–Yamphodin, 3100 m (Nov. 17, 1963, fr.).

Distr. Himalaya (Kumaon to Bhutan), S. E. Tibet, and W. China (Yunnan, Szechuan).

Cotoneaster nitidus Jacques in Journ. Soc. Imp. Centr. Hort. **3**: 516 (1859)–Exell in Journ. Bot. **68**: 299 (1930)–Klotz in Wiss. Z. Univ. Halle, Math. **6**: 966 (1957); in Bull. Bot. Surv. Ind. **5**: 210 (1963)1)

C. rotundifolia (non Wallich ex Lindley 1829) Baker in Saunders, Refug. Bot. **1**: t. 54 (1869), excl. ill. flor.–Hook. f., l.c. 386 (1878), pro parte–Hemsley in Bot. Mag. **131**: t. 8010 (1905), excl. syn. et ill. flor.

C. distichus Lange in Bot. Tidskr. **13**: 19 (1882)–Yü, l.c. 127 (1954).

Hati Sar–Minchin Dhap, 2600 m (Oct. 28, 1963, fr.); Minchin Dhap–Mul Pokhari, 2900 m (Oct. 29, 1963, fr.); Siling Tzokupa, 3200 m (Nov. 21, 1963, fr.); Batasay–Bhuspata Danra, 2800 m (Dec. 1, 1963, fr.).

Distr. E. Himalaya (E. Nepal to Bhutan), Assam, N. Burma, and W. China (Yunnan).

subsp. **Cavei** (Klotz) Ohashi, comb. nov.

C. distichus var. *parvifolius* Yü in Bull. Brit. Mus. **1**: 129 (1954), p.p.

C. Cavei Klotz in Bull. Bot. Surv. Ind. **5**: 213 (1963).

Sandakphu–Garibans, 3500–2800 m (Jun. 7, 1960, fl.).

Distr. E. Himalaya (Sikkim) and W. China (Yunnan).

C. Cavei Klotz seems to be an ecologically differentiated form from *C. nitidus* Jacques adapted to more or less humid places on rocks or under scrubs of *Rhododendron* forests. As to the differences of the size of pomes of these two are not always clear. Among our collections the fruits of *C. nitidus* are 8–12 mm long.

Docynia indica (Wall.) Decaisne in Nouv. Arch. Mus. Paris **10**: 131, pl. 14 (1874)–Fl. Brit. Ind. **2**: 369 (1878).

Pyrus indica Wallich, Pl. Asia. Rar. **2**: 56, t. 173 (1831).

Eriolobus indica (Wall.) Rehder in Sargent, Tr. Shr. **1**: 74 (1905).

Yoksam, 1700 m (May 16, 1960, no. 338, young fr.); Dhankuta, 1200 m, cult. (Oct. 21, 1963, fr.); Taplejung, 1800 m (Oct. 31, 1963, fr.); Taplejung–Garhi Danra, 1900–2200 m (Nov. 3, 1963, fr.); Tuwa–Taplethok, 1800–1400 m (Nov. 5, 1963, fr.); Taplethok–Helok, 1400–1500 m (Nov. 6, 1963); Ghatte, 1600 m (Nov. 17, 1963, fr.).

Distr. E. Himalaya (E. Nepal to NEFA), Khasia, Manipur, and N. Burma.

Duchesnea indica (Andr.) Focke in Engl., Pfl.-fam. III, **3**: 33 (1888)–Hara et Kurosawa in Journ. Jap. Bot. **34**: 165, figs. (1959).

Fragaria indica Andrews, Bot. Repos. **7**: t. 479 (1807)–Fl. Brit. Ind. **2**: 343 (1878).

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1) *C. Taylorii* Yü was distinguished from *C. nitidus* Jacques in having 2–3-flowered cymes, longer pubescent pedicels, obtuse but rarely acutish leaves and irregularly branching habit. After having examined our specimens of *C. nitidus*, however, I noticed that the length of pedicels varies considerably and the apex of leaves is sometimes obtuse. Rarely *C. nitidus* bears two flowers in one axil. A great similarity in outer morphological characters has been found to support the view in treating *C. Taylorii* as a subspecies of *C. nitidus*. Furthermore, Klotz (1963) mentioned that *C. Taylorii* may be an ecospecies within true *C. nitidus*, its morphological differences from the latter having been originated by the special conditions near streams.

Cotoneaster nitidus Jacques subsp. **Taylorii** (Yü) Ohashi, comb. nov.

C. Taylorii Yü in Bull. Brit. Mus. **1**: 129, pl. 3 (1954)–Klotz in Bull. Bot. Surv. Ind. **5**: 211 (1963).

Potentilla denticulosa Seringe in DC., Prodr. **2**: 573 (1825).

P. Wallichiana Seringe, l.c. 574 (1825).

Duchesnea major (Makino) Makino in Journ. Jap. Bot. **2** (5): 19 (1921).

Darjeeling, 2100 m (Apr. 1 & 5, 1960, fl.); Takdah-Rayang, 500m (Apr. 20, 1960); Kalimpong, 1300 m (Apr. 23, 1960, fr.); Mani Bhanjang-Batasi, 2000 m (May 1, 1960 no. 29, fr.); Batasi-Palmajua, 2300–2600 m (May 3, 1960, fr.); Palmajua-Rimbick, 2200–1500 m (May 5, 1960, no. 157, fr.); Tingling Bridge-Yoksam, 1000–1700 m (May 16, 1960, no. 314, fr.); Gangtok, 1600 m (Jun. 15, 1960, fr.); Sunderijal, 1600 m (Sep. 20, 1963, fr.); Pouwa, 1600 m (Oct. 9, 1963, fr.) ; Murhay-Bilbatay Bhanjang, 2100–2200 m (Oct. 24, 1963, fr.); Taplethok-Helok, 1400–1500 m (Nov. 6, 1963, fr.).

Distr. Afghanistan, Himalaya, India, east to China and Japan, and south to Malaysia.

Our Himalayan specimens are mostly smaller than the type form illustrated by Andrews, but some from Darjeeling and Palmajua are as large as the latter, and also agree with the Japanese plants. As far as we have hitherto examined, the Himalayan plants are dodecaploid with $2n=84$ chromosomes (see page 660). A few specimens from Nepal, however, have slightly verruculose achenes, and it is probable that other chromosome number may be found also from India.

Eriobotrya Hookeriana Decaisne in Nouv. Arch. Mus. Paris **10**: 146 (1874)–Hook. f., Fl. Brit. Ind. **2**: 371 (1878).

Yoksam-Bakkim, 1700–2200 m (May 18, 1960, no. 343, fr.); Iladanda-Selap, 1800–2600 m (Nov. 9, 1963, fl.); Ghatte-Khebang, 1600–2400 m (Nov. 19, 1963, fl.); near Chyangthaphu-Birwa, 1300–2400 m (Nov. 27, 1963, fl.).

Distr. E. Himalaya (E. Nepal to Bhutan).

Fragaria Daltoniana J. Gay in Ann. Sci. Nat. ser. 4, **8**: 204 (1857), e typo –Fl. Brit. Ind. **2**: 345 (1878)–Kitam., Faun. & Fl. Nepal Himal. 149 (1955).

F. sikkimensis Kurz in Journ. Asia. Soc. Beng. **44** (3): 206 (1876).

Phalut-Chia Bhanjang, 3600–3100 m (May 11, 1960, fl.); Bakkim-Jongri, 3500–4000 m (May 19, 1960, fl.); Jongri-Preig Chu, 3900 m (May 23, 1960, fl.); Chia Bhanjang-Phalut, 3100–3500m (Jun. 2 & 3, 1960, fl.); Sandakphu-Garibans, 3500–2800 m (Jun. 7, 1960, fl., fr.); Chitray, 2100 m (Oct. 24, 1963).

Distr. E. Himalaya (Nepal, Sikkim).

Fragaria nilgerrensis Schlechtend. ex J. Gay, l.c. 206 (1857), e typo–Fl. Brit. Ind. **2**: 344 (1878)–Cardot in Not. Syst. **3**: 228 (1916).

Sandakphu, 3600m (May 7, 1960, fl.); Chia Bhanjang-Phalut, 3100–3500m (Jun. 2, 1960, no. 623, fl.); Phalut-Sandakphu, 3500 m (Jun. 6, 1960, no. 676, fl.); Garibans, 2800 m (Jun. 7, 1960, fr.).

Distr. E. Himalaya (E. Nepal, Sikkim), Khasia, Nilghiris, Manipur, Indo-China, and W. & C. China.

Fragaria nubicola Lindley [in Wallich, Cat. no. 1238 (1829), nom. nud.] ex Lacaita in Journ. Linn. Soc. **43**: 467 (1916), cum diagn. latin.–Kitam., l.c. 149 (1955)–Spring Fl. Sikkim Himal. f. 77 (1963).

F. vesca var. *nubicola* Hook. f., Fl. Brit. Ind. **2**: 344 (1878).

Rimbick, 2200 m (May 6, 1960, fl., fr.); Rimbick-Ramam, 1900–2400 m (May 7, 1960, fl.); Phalut-Chia Bhanjang, 3000–3500 m (May 11 & Jun. 2, 1960, no. 192, fl.); Bakkim-Jongri, 2500–3000 m (May 19, 1960, no. 380, fl.); Gamothang, 3750 m (May

27, 1960, fl.); Sandakphu–Garibans, 3500–2800 m (Jun. 7, 1960, no. 698, p.p., fr.); Rabong La, 2200 m (Mar. 28, 1963, fl.); Murhay, 2000 m (Oct. 23, 1963); Lelep, 2600 m (Nov. 9, 1963, fl.).

Distr. Himalaya (Kashmir to Sikkim), N. Burma, and W. China.

Fragaria rubiginosa Lacaita in Journ. Linn. Soc. **43**: 467 (1916), e typo–Spring Fl. Sikkim Himal. f. 78 (1963).

F. vesca var.? *collina* Hook. f., Fl. Brit. Ind. **2**: 344 (1878), p.p.

Ghum, 2300 m (Apr. 4, 1960, fl.); Batasi–Palmajua, 2300–2600 m (May 3, 1960, no. 76, fl.); Chia Bhanjang–Phalut, 3100–3500 m (Jun. 2, 1960, no. 624, p.p., fl.); Sandakphu–Garibans, 3100–2800 m (Jun. 7, 1960, no. 698, p.p., fr.).

Distr. Himalaya (Garhwal to Sikkim).

The genus *Fragaria* is well differentiated in Eastern Himalaya, and the four species enumerated above are clearly separable from each other.

Neillia rubiflora D. Don, Prodr. Fl. Nepal. 229 (1825)–Fl. Brit. Ind. **2**: add. (1879)–Spring Fl. Sikkim Himal. f. 99 & 100 (1963).

Chia Bhanjang–Dentam, 3100–1400 m (May 11, 1960, no. 206, bud); Sandakphu–Garibans, 3500–2800 m (Jun. 7, 1960, fl.); Tonglu, 3000 m (Jun. 8, 1960, fl.); Hati Sar–Minchin Dhap, 2700–2900 m (Oct. 28, 1963, fr.); Minchin Dhap–Mul Pokhari, 2900–2500 m (Oct. 29, 1963, fr.); Walunchung Gola–Zongi, 3800–2800 m (Nov. 11, 1963, fr.); Thakma Khola, 3000 m (Nov. 12 & 16, 1963, fr.); Thakma Khola–Diorali Bhanjang, 3200–3400 m (Nov. 14, 1963); Bhuspate Danra, 2600 m (Dec. 2, 1963, fr.).

Distr. E. Himalaya (Nepal to NEFA), and W. China (Yunnan).

Neillia thyrsiflora D. Don, Prodr. Fl. Nepal. 228 (1825)–Fl. Brit. Ind. **2**: add. (1879)–Schneider, Ill. Handb. **1**: 446, f. 285 k–n, f. 286 i–k (1905).

Darjeeling, 1900–2200 m (Apr. 7 & Jun. 26, 1960; Dec. 26, 1963, fr.); Takdah, 1600 m (Apr. 19, 1960, fr.); Gangtok, 1650 m (Apr. 26, 1960); Yoksam, 1700 m (May 17, 1960, fr.); Murhay, 2000 m (Oct. 23, 1963, fr.); Mul Pokhari–Nissim, 1900 m (Oct. 30, 1963, fr.); Taplejung–Garhi Danra, 1900–2200 m (Nov. 3, 1963, fl.); Garhi Danra–Linkhim, 2200–1800 m (Nov. 4, 1963, fl.); Yamphodin–Ghatte, 2100–1600 m (Nov. 16, 1963, fr.); Ghatte–Khebang, 1600–2400 m (Nov. 19, 1963, fr.); below Siling Tzokupa, 2200 m (Nov. 21, 1963, fr.).

Distr. E. Himalaya (Nepal to NEFA), Khasia, Manipur, N. Burma, and W. China (Yunnan).

Photinia integrifolia Lindley in Trans. Linn. Soc. **13**: 103 (1821)–Decne. in Nouv. Arch. Mus. Paris **10**: 142 (1874)–Hook. f., Fl. Brit. Ind. **2**: 381 (1878).

Senchal–Takdah, 1900 m (Apr. 17, 1960, no. 1943, bud); Palmajua–Rimbick, 2300–2200 m (May 5, 1960, fl.); Rimbick, 2200 m (May 6, 1960, fl.); Chia Bhanjang–Dentam, 2000 m (May 11, 1960, no. 232, fl.); Tendong–Damthang, 2300 m (Mar. 26, 1963, bud); Iladanda–Selap, 2400 m (Nov. 9, 1963, young fr.); near Chyangthaphu–Birwa, 2100 m (Nov. 27, 1963, fr.); Batasay–Bhuspate Danra, 2500 m (Dec. 1, 1963).

Distr. E. Himalaya (Nepal to NEFA), Khasia, N. Burma, and W. China.

Potentilla coriandrifolia D. Don, Prodr. Fl. Nepal. 232 (1825)–Fl. Brit. Ind. **2**: 353 (1878)–Wolf, Monogr. Potent. 330 (1908)–Kitamura, Faun. & Fl. Nepal Himal. 150 (1955).

Jongri–Olothang, 3900 m (May 23, 1960).

Distr. E. Himalaya (Nepal, Sikkim), and China (Yunnan).

Potentilla fruticosa L. var. **rigida** (Wall. ex Lehm.) Wolf, Monogr. Potent.

57 (1908)-Kitamura, Faun. & Fl. Nepal Himal. 152 (1955).

P. arbuscula D. Don, Prodr. Fl. Nepal. 256 (1825)-Hand.-Mzt. in Act. Hort. Gothob. **13**: 289 (1939).

Sandakphu, 3600 m (May 7, 1960; Sep. 16, 1964); Jongri, 3900–4100 m (May 21 & 23, 1960); Jongri-Gamothang, 4200–4500 m (May 26, 1960); Gamothang-Migothang (May 30, 1960); Migothang, 3900 m (May 31, 1960); Sandakphu-Garibans (Jun. 7,1960).

Distr. sp. Eurasia, and North America.

Potentilla fulgens Wall. in Lehmann. Rev. Potent. 54 (1856)-Fl. Brit. Ind. **2**: 349 (1878)-Wolf, Monogr. Potent. 145 (1908)-Kitamura, Faun. & Fl. Nepal Himal. 152 (1955).

P. splendens (non Ramond. 1805) Wall. ex D. Don, Prodr. Fl. Nepal. 230 (1825)-Bot. Mag. t. 2700 (1826).

Chia Bhanjang-Phalut, 3100 m (Jun. 2, 1960); Sandakphu-Garibans, 3000m (Jun. 7, 1960); Kakani, 2200 m (Sep. 24, 1963); Dhankuta-Murhay, 1700m (Oct. 23, 1963); Sinduwa (Oct. 22, 1963); Bilbatay Bhanjang-Hati Sar (Oct. 27, 1963); Hati Sar-Minchin Dhap, 2700–2900 m (Oct. 28, 1963); Bilbatay Bhanjang, 2200 m (Oct. 23, 1963); Iladanda-Helok, 1700m (Nov. 13, 1963); Baroya Khimty, 2500 m (Nov. 15, 1963); Bhandukay, 2400 m (Nov. 15, 1963); Baroya Khimty-Thakma Khola, 2600 m (Nov. 16, 1963); Diorali Bhanjang-Bhandukay (Nov. 17, 1963); Birwa-Yektin (Nov. 28, 1963); Senchal, 2300 m (Sep. 19, 1964).

Distr. E. Himalaya (Kunawur to Sikkim), Khasia, and W. China (Yunnan, Szechuan, Kweichow).

Potentilla Kleiniana Wight, Illustr. t. 85 (1831)-Wight et Arn., Fl. Penins. Ind. Or. **1**: 300 (1834)-Fl. Brit. Ind. **2**: 359 (1878)-Hand.-Mzt., Symb. Sin. **7**: 516 (1933).

P. Wallichiana (non Seringe 1825) Delile in Wall., Cat. 28 (1829), nom. nud.-Lehm., Rev. Potent. 80, t. 34 (1856)-Wolf, Monog. Potent. 411 (1908).

Takdah, 1600m (Apr. 9, 1960); Kurseong, 1600m (Apr. 12, 1960); Mani Bhanjang-Batasi, 200 m (May 1, 1960); Palmajua, 2300 m (May 4, 1960, no. 58); Gangtok, 1950 m (Apr. 26, 1960; June 16, 1960); Tendong Peak, 2750 m (Mar. 26, 1963); Dhankuta-Sinduwa (Oct. 22, 1963, fl.); Sinduwa, 2100 m (Oct. 24, 1963); Minchin Dhap-Mul Pokhari, 2900–2500 m (Oct. 29, 1963, fl.); below Siling Tzokupa-Siling Tzokupa (Nov. 21, 1963, fl.); Batasay-Bhuspate Danra, 2400–2800 m (Dec. 1, 1963, fl.); Bhuspate Danra-Mai Majuwa (Dec. 3, 1963, fl.).

Distr. Himalaya (Kashmir to NEFA), Khasia, Ceylon, S. China (Yunnan, Szechuan, Kweichow), and Java.

Potentilla leuconota D. Don, Prodr. Fl. Nepal. 230 (1825)-Fl. Brit. Ind. **2**: 352 (1878)-Wolf, Monogr. Potent. 679 (1908)-Kitamura in Act. Phytotax. Geobot. **20**: 31 (1962).

P. leuconota var. *morrisonicola* Hayata in Journ. Coll. Sci. Univ. Tokyo **25**: 83 (1908).

Along Choktsering Chu, north of Jongri, 4000–4500m (May 25, 1960); Gamothang, 2800 m (May 29, 1960), 3750m (May 29, 1960, no. 571); Jongri-Gamothang, 4200–3600 m (May 26, 1960); Migothang-Nayathang, 3400–3300 m (Jun. 1, 1960); Sandakphu-Phalut, 3500 m (Jun. 6, 1960); Sandakphu, 3600 m (Sep. 16, 1964); Chia Banjang-Phalut, 3100–3500 m (Jun. 1, 1960); Senchal, 2400 m (Apr. 2, 1963).

Distr. E. Himalaya (Garhwal to Bhutan), and W. China (Szechuan, Yunnan, Sikang), Formosa, and Borneo (Kina Balou).

Potentilla microphylla D. Don var. **achilleaefolia** Hook. f., Fl. Brit. Ind. **2**: 353 (1878)–Wolf, Monogr. Potent. 682 (1908)–Kitamura, Faun. & Fl. Nepal Himal. 152 (1955).

Jongri, 4000–4200 m (May 21, 1960); along the Choktsering Chu, north of Jongri, 4000–4500 m (May 25, 1960).

Distr. E. Himalaya (Garhwal to Assam), China (Yunnan), and New-Guinea.

Potentilla monanthes Lindl. var. **sibthorpioides** Hook. f., Fl. Brit. Ind. **2**: 358 (1878)–Wolf, Monogr. Potent. 413 (1908).

Jongri, 4000–4200 m (May 21, 1960); along Choktsering Chu, 4000–4500 m (May 25, 1960); Jongri–Gamothang (May 26, 1960); Gamothang, 3900 m (May 29, 1960); Gamothang–Migothang, 4000 m (May 30, 1960); Migothang, 3900 m (May 31, 1960, no. 597).

Distr. E. Himalaya (Nepal, Sikkim).

Potentilla Mooniana Wight, Icon. t. 233 (1839)–Fl. Brit. Ind. **2**: 349 (1878)–Kitamura, Faun. & Fl. Nepal Himal. 152 (1955).

P. polyphylla Wall. ex Lehm., Rev. Potent. 53 (1856)–Wolf, Monogr. Potent. 143 (1908).

Sandakphu–Garibans, 3000–2800 m (Jun. 7, 1960); Phalut–Sandakphu, 3300 m (Jun. 6, 1960); Chia Bhanjang–Phalut, 3100–3500 m (Jun. 2, 1960); Senchal–Tiger Hill, 2400–2500m (Jun. 23, 1960); Hati Sar–Minchin Dhap, 2700–2900 m (Oct. 28, 1963); Minchin Dhap–Mul Pokhari, 2700 m (Oct. 29, 1963); Mul Pokhari–Gorzu Kosir, 2200 m (Oct. 30, 1963); Dumhan–Taplejung, 1400 m (Nov. 1, 1963); Taplejung, 1700 m (Nov. 2, 1963).

Distr. Himalaya (Kumaon to Sikkim), Khasia, and Ceylon.

Potentilla nivea L. var. **himalaica** Kitamura, Faun. & Fl. Nepal Himal. 153 (1955); Pl. W. Pakist. & Afgh. 84 (1964).

P. nivea L. sensu Hook. f., Fl. Brit. Ind. **2**: 358 (1878).

Gamothang, 3800 m (May 29, 1960).

Distr. Himalaya (Karakoram to Sikkim).

Potentilla peduncularis D. Don, Prodr. Fl. Nepal. 230 (1825)–Fl. Brit. Ind. **2**: 351 (1878)–Wolf, Monogr. Potent. 677 (1908)–Hand.-Mzt. in Act. Hort. Gothob. **13**: 322 (1939).

Jongri, 4200 m (May 22, 1960); along Choktsering Chu, 4000–4500 m (May 25, 1960); Jongri–Gamothang, 4200–3600 m (May 29, 1960); Gamothang–Migothang, 3800 m (May 30, 1960); Migothang, 3900 m (May 31, 1960).

Distr. E. Himalaya (Nepal, Sikkim), N. Burma, S. E. Tibet, and W. China (Yunnan and Sikang).

Potentilla reptans L. var. **microphylla** Trattin., Ros. Monogr. **4**: 80 (1824)–Wolf, Monogr. Potent. 657 (1908).

Dentam–Pamianchi, 1500–2000 m (May 12, 1960).

Distr. sp. Eurasia.

Potentilla Saundersiana Royle, Ill. Bot. Himal. 207, t. 41 (1839)–Wolf, Monogr. Potent. 242 (1908).

P. multifida var. *Saundersiana* Hook. f., Fl. Brit. Ind. **2**: 354 (1878).

Jongri-Olothang, 3900 m (May 23, 1960); Gamothang, 3750 m (May 29, 1960, no. 572).

Distr. E. Himalaya (Kunawur to Sikkim), Tibet, and S. China (Yunnan).

Pourthiaea arguta (Wall. ex Lindl.) Decaisne in Nouv. Arch. Mus. Paris **10**: 147 (1874)–Hook. f., Fl. Brit. Ind. **2**: 382 (1878).

Photinia arguta Wallich [Cat. no. 672 (1828), nom. nud.] ex Lindley in Bot. Reg. **13**: sub t. 1956 (1837).

Sorbus arguta (Wall. ex Lindl.) Zabel in Beissner, Schelle et Zabel, Handb. Laubh.-Benen. 200 (1903).

Batasi–Palmajua, 2100–2300 m (May 3, 1960, no. 54, fr.).

Distr. E. Himalaya (Sikkim, NEFA), Khasia, Manipur, and Burma.

This is a very variable species. Our specimens differ from the typical form in having longer, lanceolate, acuminate leaves (5–10 cm long) and corymbs (5–7 cm long) bearing globose fruits (5–7 mm in diam.), and are referrable to var. *Hookeri* (Decne.) Hooker f.

Prinsepia utilis Royle, Ill. Bot. Himal. 206, t. 38, f. 1 (1839)–Fl. Brit. Ind. **2**: 323 (1878)–Rehder in Pl. Wilson. **2**: 345 (1916).

Godavari, Kathmandu, 1500 m (Dec. 26, 1963, fl.).

Distr. Himalaya (Hazara to Bhutan), Khasia, and China (Yunnan, Szechuan, Kweichow).

Prunus cerasoides D. Don, Prodr. Fl. Nepal. 239 (Feb. 1825)–Koehne in Pl. Wilson. **1**: 253 (1912)–Rehder, Man. ed. 2, 470 (1940); Bibl. 335 (1949).
[Pl. 12 a, b]

Cerasus Puddum Seringe in DC., Prodr. **2**: 537 (Nov. 1825).

Prunus Puddum (non Miq. 1865) Roxburgh ex Brandis, For. Fl. Brit. Ind. 194 (1874)–Fl. Brit. Ind. **2**: 314 (1878).

Gangtok, 1600 m (Apr. 26 & Jun. 18, 1960, fr.); Palmajua–Rimbick, 2000–2200 m (May 5, 1960, nos. 89 & 152, fr.); Yoksam, 1800 m (May 17, 1960, no. 607); Darjeeling, 2100–2200 m (Dec. 25, & 26, 1963); Dhankuta–Hilay, 1200–1800 m (Oct. 23, 1963, fl.); Sinduwa, 2100 m (Oct. 24, 1963, fl.); Mul Pokhari–Dumhan, 2400–700 m (Oct. 30, 1963, fl.); Taplejung, 2000 m (Nov. 1, 1963, fl.); Ghatte, 1600 m (Nov. 18, 1963, fl.).

Distr. Himalaya (Kashmir to Bhutan), S. Tibet, Khasia, Manipur, N. Burma, and W. China (W. Yunnan).

var. **rubea** C. Ingram in Gard. Chron. ser. 3, **122**: 162 (1947)–Sealy in Bot. Mag. n. s. t. 12 (1948).

Gangtok, 1500 m, planted (Mar. 24, 1963, fr.)

Distr. E. Himalaya (Sikkim, Bhutan), Naga Hills, Manipur, N. Burma, and W. China (W. Yunnan).

Prunus cornuta (Wall. ex Royle) Steudel, Nom. Bot. ed. 2, **2**: 403 (1841)–Koehne in Fedde, Rep. **9**: 35 (1910)–Bot. Mag. t. 9423 (1935).

Cerasus cornuta Wallich [Cat. no. 716 (1829), nom. nud.] ex Royle, Ill. Bot. Himal. 207, t. 38, f. 2 (1834).

P. Padus L. sensu Brandis, Forest. Fl. 194 (1874)–Fl. Brit. Ind. **2**: 315 (1878).

Thakma Khola–Diorali Bhanjang, 3400 m (Nov. 14, 1963).

var. **villosa** Hara in Journ. Jap. Bot. **37**: 98 (1962).

Phalut–Sandakphu, 3500 m (Jun. 6, 1960, no. 678, fl.—Typus); Selap–Walunchung Gola, 2600–3800 m (Nov. 10, 1963, fr.).

Distr. sp. Afghanistan, Himalaya (Kashmir to Bhutan), and W. China.

The variety differs clearly from typical *P. cornuta* in having leaves densely villose on the under surface, and with shorter serration, much larger stipules and bracts, and cupules quite glabrous inside.

Prunus napaulensis (Ser.) Steudel, Nom. Bot. ed. 2, **2**: 403 (1841), ut *nepaulensis*–Fl. Brit. Ind. **2**: 316 (1878)–Koehne, l.c. 34 (1910)–Rehder, Man. ed. 2, 479 (1940); Bibl. 347 (1949).

Cerasus napaulensis Seringe in DC., Prodr. **2**: 540 (1825).

Darjeeling, 2100 m (Apr. 2, 1960, fl.); Mani Bhanjang–Batasi, 2000 m (May 1, 1960, no. 17, young fr.); Rimbick, 2200 m (May 6, 1960, young fr.); Yoksam–Bakkim, 2200 m (May 18, 1960, no. 404, young fr.); Bakkim by the Preig Chu, 2200 m (May 19, 1960, no. 422, young fr.).

Distr. Himalaya (Kumaon to NEFA), Khasia, Manipur, N. Burma, and W. China (Yunnan).

Prunus rufa Hooker f., Fl. Brit. Ind. **2**: 314 (1878), p.p.—Koehne in Pl. Wilson. **1**: 254 (1912)–Rehder, Man. ed. 2, 470 (1940); Bibl. 335 (1949)–Hara in Journ. Jap. Bot. **37**: 98 (1962).

Cerasus rufa Wallich, Cat. no. 721 (1829), nom. nud.

Prunus rufa Steudel, Nom. Bot. ed. 2, **2**: 404 (1841), nom. nud.

Sandakphu–Phalut, 3300–3600 m (May 8, 1960, fl.); Ramam–Phalut, 2400–3500 m (May 9, 1960, fl.); Gamothang, 3800 m (May 29, 1960, no. 587, fl.).

var. **trichantha** (Koehne) Hara in Journ. Jap. Bot. **37**: 99 (1962)–Spring Fl. Sikkim Himal. f. 103 (1963).

P. trichantha Koehne in Pl. Wilson. **1**: 254 (1912).

P. Imanishii Kitamura in Act. Phytotax. Geobot. **15**: 131 (1954); Faun. & Fl. Nepal Himal. 155, f. 29 (1955).

Sandakphu–Phalut, 3300–3600 m (May 8, 1960, fl.; Jun. 6, 1960, no. 674, fl.); Phalut–Chia Bhanjang, 3600–3100 m (May 11, 1960, no. 204, fl.); Bakkim–Jongri, 2500–4000 m (May 19, 1960, fl.); Gamothang, 3700 m (May 27, 1960, no. 515, fl.); Migothang, 3900 m (May 31, 1960, no. 596, fl.); Migothang–Nayathang, 3900–3300 m (Jun. 1, 1960, fl.); Phalut, 3500 m (Jun. 5, 1960, no. 660, fl.).

Distr. sp. E. Himalaya (Nepal to Bhutan), S. Tibet, and N. Burma.

Prunus undulata Hamilton ex D. Don, Prodr. Fl. Nepal. 239 (1825)–Fl. Brit. Ind. **2**: 316 (1878)–Koehne in Engl., Bot. Jahrb. **52**: 285 (1915).

Ramam–Phalut, 2400–3500 m (May 9, 1960, fl.); Nayathang–Phalut, 3100 m (Jun. 2, 1960); Minchin Dhap–Mul Pokhari, 2900–2500 m (Oct. 29, 1963, fr.); Helok–Baroya Khimty, 1500–2500 m (Nov. 10, 1963).

Distr. Himalaya (Kumaon to Bhutan), and Khasia.

Prunus Wallichii Steudel, Nom. Bot. ed. 2, **2**: 404 (1841)–Kalkman in Blumea **13**: 38 (1965).

Cerasus acuminata Wallich, Pl. Asia. Rar. **2**: 78, t. 181 (1831).

P. acuminata (non Michx. 1803) (Wall.) D. Dietrich, Syn. **3**: 42 (1843)–Fl. Brit. Ind. **2**: 317 (1878)–Koehne in Engl., Bot. Jahrb. **52**: 296 (1915).

Iladanda—Helok, 1800–1500 m (Nov. 13, 1963, fl.).

Distr. E. Himalaya (Nepal, Sikkim), Khasia, N. Burma, N. Thai, Indo-China, W. & S. China, Malay, and Sumatra.

Pyracantha crenulata (D. Don) Roemer, Syn. **3**: 220 (1847)–Decne. in Nouv. Arch. Mus. Paris **10**: 171 (1874)–B. Jackson in Gard. Chron. ser. 3, **60**: 309 (1916).

Mespilus crenulata D. Don, Prodr. Fl. Nepal. 238 (1825).

Crataegus crenulata Roxburgh [Hort. Beng. 38 (1814), nom. nud.] Fl. Ind. ed. 2, **2**: 509 (1832)–Lindley in Bot. Reg. **30**: 52 (1844)–Fl. Brit. Ind. **2**: 384 (1878).

Cotoneaster Pyracantha var. *crenulata* (D. Don) Loudon, Arb. ed. 2, **2**: 844 (1844).

Cotoneaster crenulata (D. Don) K. Koch, Dendrol. **1**: 175 (1869).

Godavari, 1500 m (Sep. 18, 1963, fr.); Dhankuta, 1200 m (Oct. 19, 20, & 21, 1963, fr.); Upper Dhankuta (Oct. 23, 1963, fr.).

Distr. sp. Himalaya (Sirmor to Bhutan) and W. China (Yunnan).

Pyrus communis L., Sp. Pl. ed. 1, **1**: 479 (1753)–Fl. Brit. Ind. **2**: 374 (1878).

Dumhan–Taplejung, 700–1900 m (Nov. 1, 1963, fr.).

Distr. A native of Europe and W. Asia, but commonly cultivated and often escaped or naturalized.

Pyrus Pashia Hamilton ex D. Don, Prodr. Fl. Nepal. 236 (1825)–Fl. Brit. Ind. **2**: 374 (1878)–Hand.-Mzt., Symb. Sin. **7**: 465 (1933).

Godavari, 1500 m (Sep. 18, 1963, fr.); Kakani Hill, 2100 m (Sep. 24, 1963, fr.).

Distr. Himalaya (Kashmir to Bhutan), Khasia, Manipur, Indo-China, and W. China (Yunnan).

Rosa Brunonii Lindley, Ros. Monogr. 120, t. 14 (1820)–Hook. in Bot. Mag. t. 4030 (1843)–Rehd. et Willson in Pl. Wilson. **2**: 306 (1915)–Byhouwer in Journ. Arn. Arb. **10**: 87 (1929)–Rehder, Man. ed. 2, 446 (1940); Bibl. 312 (1949)–Kitamura, Faun. & Fl. Nepal Himal. 156, f. 30 (1955).

R. moschata var. *nepalensis* Lindley in Bot. Reg. **10**: t. 829 (1824)–Willmott, Gen. Ros. 37, t. 10 (1914).

R. moschata Mill. sensu Hook. f., Fl. Brit. Ind. **2**: 367 (1879).

Godavari, 1500 m (Sep. 18, 1963, fr.).

Distr. Himalaya (Murree to Nepal), and W. China (Yunnan, Szechuan).

Rosa sericea Lindley, Ros. Monogr. 105, t. 12 (1820)–Hook. in Bot. Mag. t. 5200 (1860)–Fl. Brit. Ind. **2**: 367 (1879)–Willmott, l.c. 163, t. 52 (1914)–Byhouwer, l.c. 102 (1929)–Kitamura, l.c. 157, f. 31 (1955)–Spring Fl. Sikkim Himal. f. 124 & 125 (1963).

Palmajua–Rimbick, 2200 m (May 5, 1960, fl.); Rimbick, 2200 m (May 6, 1960, fl.); Rimbick–Ramam, 1900–2400 (May 7, 1960, no. 96, fl.); Bakkim–Jongri, 2500–4000 m (May 19, 1960, no. 374, fl.); Nayathang–Phalut (Jun. 2, 1960, no. 772, fl.); Phalut, 3300 m (Jun. 5, 1960, fl.); Sandakphu–Garibans, 3000–2800 m (Jun. 7, 1960, fl.); Bilbatay Bhanjang, 2200 m (Oct. 26, 1963, fl.); Tinjuray–Hati Sar, 2700 m (Oct. 27, 1963, fl.); Hati Sar–Minchin Dhap, 2700 m (Oct. 28, 1963, fl.); Minchin Dhap–Mul Pokhari, 2900 m (Oct. 29, 1963, old fl.); Selap–Walunchung Gola, 2600 m (Nov. 10, 1963, old fl.); Bhuspate Danra–Mai Majuwa, 3000 m (Dec. 3, 1963, fl.); Sandakphu, 3600 m (Sep. 16, 1964, fr.).

Distr. Himalaya (Kumaon to Bhutan), Tibet, Manipur, N. Burma, and W.

China (Yunnan, Szechuan).

Rubus acuminatus Smith in Rees, Cyclop. **30**: no. 32 (1819)–Fl. Brit. Ind. **2**: 327 (1878)–Focke in Bibl. Bot. **17** (72): 68 (1910).

R. betulinus D. Don, Prodr. Fl. Nepal. 233 (1825).

Godavari, Kathmandu, 1500 m (Sep. 18, 1963, fr.); Murhay, 2100 m (Oct. 23, 1963, fr.); Sinduwa, 2100 m (Oct. 23, 1963, fr.); Tharpu–Khunga, 2500 m (Nov. 27, 1963, fr.); Darjeeling, 2200 m (Dec. 26, 1963, fr.).

Distr. Himalaya (Kumaon to Sikkim), Khasia, Manipur, Tonkin, and W. China (Yunnan).

Rubus asper D. Don, Prodr. Fl. Nepal. 234 (1825)–Merrill in Contr. Arn. Arb. **8**: 71 (1934), in nota.

R. rosifolius Smith var. *asper* (D. Don) O. Kuntze, Rev. Gen. Pl. **1**: 224 (1891).

R. indotibetanus Koidzumi, Fl. Symb. Or.-Asia. 65 (1930)–Hand.-Mzt., Symb. Sin. **7**: 500 (1933)–Bolle in Notizbl. **13**: 434 (1936)–Merrill in Brittonia **4**: 83 (1941).

Darjeeling, 2000 m (Apr. 5, 1960, fl.); Palmajua–Rimbick, 2200 m (May, 5, 1960, fl.); Takdah, 1600–1700 m (Apr. 19, 1960, no. 2143, fl.); Rabong La–Temi, lower road, 1200 m (Mar. 28, 1963, fl.).

Distr. E. Himalaya (Nepal, Sikkim), Assam, E. Tibet, N. Burma, Tonkin, and W. China.

I have examined at the British Museum the type of *R. asper* D. Don collected by Wallich in Nepal, and have confirmed that it has very short stipitate glands only about 0.5 mm long, and that it is identical with *R. indotibetanus* Koidzumi. Our specimens are considerably variable especially in the size of leaflets and the density of glandular hairs, and some closely resemble *R. rosaefolius* Smith. *R. croceacanthus* Léveillé of Japan and S. Korea, and *R. rosaefolius* var. *formosanus* Card. of Formosa are also very near to *R. asper*, but have roundish fruits, and generally coarser less-pointed serration of leaves. The *R. rosaefolius*—*R. asper* group needs intensive critical studies over its entire area in Asia. The relationship between *R. asper* and *R. sumatranus* is given in a note under the latter species.

Rubus calycinus Wallich ex D. Don, Prodr. Fl. Nepal. 235 (1825)–Fl. Brit. Ind. **2**: 327 (1878)–Focke in Bibl. Bot. **17** (72): 19, f. 5 (1910).

Ghum, 2300 m (Apr. 4, 1960, fl.); Senchal, 2400 m (Apr. 6, 1960, fl.); Mani Bhanjang–Batasi, 2000 m (May 1, 1960, fl.); Batasi, 2000 m (May 2, 1960, no. 3, fl.); St. Paul Hill, Darjeeling, 2100 m (Jun. 19, 1960, fr.); Gangtok, 1600 m (Jun. 15, 1960, fr.); Sinduwa, 2100 m (Oct. 25, 1963); Bhuspate Danra, 2600 m (Dec. 2, 1963); Selap–Walunchung Gola (Nov. 10, 1963).

Distr. Himalaya (Nepal to NEFA), Khasia, Manipur, N. Burma, and W. China (Yunnan).

The petioles are densely aculeate in some specimens, while they are almost inermous in some others.

Rubus diffissus Focke in Bibl. Bot. **17** (72): 83 (1910).

Darjeeling, 2100–2200 m (Jun. 24, 1960, fl.; Dec. 25 & 26, 1963, fr.); Pouwa, Kathmandu, 1600 m (Oct. 9, 1963, fl.); Bilbatay Bhanjang, 2200 m (Oct. 25 & 26, 1963, fr.); Ghatte–Khebang, 1600–2400 m (Nov. 19, 1963, fr.); below Siling Tzokupa, 2100 m (Nov. 21, 1963, fr.); Changthaphu–Birwa (Nov. 27, 1963, fl.).

Distr. E. Himalaya (Nepal, Sikkim).

Rubus ellipticus Smith in Rees, Cyclop. **30**: no. 16 (1819)–Fl. Brit. Ind. **2**: 336 (1878)–Spring Fl. Sikkim Himal. f. 153 (1963).

R. flavus Hamilton ex D. Don, Prodr. Fl. Nepal. 234 (1825).

Mani Bhanjang–Batasi, 1900m (May 1, 1960, no. 2, fr.); Murhay, 2000m (Oct. 22, 1963, fl.); Khebang–Bharomdin, 1500 m (Nov. 24, 1963, fl.); Khunga, 2000 m (Nov. 24, 1963, fl.); Mai Majuwa–Dhara Pani, 1500–1900 m (Dec. 4, 1963, fl.); Darjeeling, 2200 m (Mar. 14, 1963, fl.).

Distr. Himalaya (Sirmore to NEFA), Khasia, Assam, Ceylon, Burma, Indo-China, and W. China.

Rubus Fockeanus S. Kurz in Journ. Asia. Soc. Beng. **44** (3): 206 (1876)–Fl. Brit. Ind. **2**: 334 (1878)–Focke in Bibl. Bot. **17** (72): 16 (1910)–Spring Fl. Sikkim Himal. f. 101 (1963).

R. nutans Wall. var. *Fockeanus* (Kurz) O. Kuntze, Rev. Gen. Pl. **1**: 223 (1891).

Ramam, 2400 m (May 8, 1960, fl.); Phalut, 3500 m (Jun. 3, 1960, no. 640, fl.); Phalut–Sandakphu, 3500 m (Jun. 6, 1960, no. 681, fl.); Bilbatay Bhanjang–Hati Sar, 2200–2900 m (Oct. 27, 1963); Minchin Dhap–Mul Pokhari, 2900–2500 m (Oct. 29, 1963); Walunchung Gola–Zongi (Nov. 11, 1963, defl.).

Distr. E. Himalaya (Nepal to Bhutan), and W. & C. China.

Rubus fragarioides Bertoloni in Mem. Accad. Sci. Bologn. **12**: 236, t. 5 (1861)–Fl. Brit. Ind. **2**: 332 (1878).

R. arcticus L. var. *fragarioides* (Bert.) Focke, l.c. 24 (1910).

Jongri, 4100 m (May 21, 1960, fl.); Migothang–Nayathang, 3300 m (Jun. 1, 1960, fl); Jongri–Gamothang, 4200–3600 m (May 26, 1960, fl.).

Distr. Sikkim.

Rubus gigantiflorus Hara in Journ. Jap. Bot. **40**: 327 (1965).

R. Hookeri (non K. Koch 1853) Focke in Abh. Nat. Ver. Bremen **4**: 198 (1874)–Fl. Brit. Ind. **2**: 334 (1878)–Focke, l.c. **17** (72): 39 (1910).

R. macrocarpus (non Benth. 1844, nec Gardner 1847) King ex Clarke in Journ. Linn. Soc. **15**: 141 (1876).

Rimbick–Ramam, 1900–2400m (May 7, 1960, no. 120, fl.); Chia Bhanjang–Dentam (May 11, 1960, fl.).

Distr. Sikkim, N. Burma, and W. China (Yunnan).

Rubus Hamiltoni Hooker f., Fl. Brit. Ind. **2**: 328 (1878)–Focke, l.c. **17** (72): 63 (1910).

Ranga Pani–Ghorwa, 500–300 m (Dec. 9, 1963, fr.).

Distr. Himalaya (Nepal, Sikkim), and Assam.

Rubus hexagynus Roxburgh, Fl. Ind. ed. 2, **2**: 516 (1832)–Fl. Brit. Ind. **2**: 327 (1878)–Focke, l.c. **17** (72): 64 (1910)–Fl. Assam **2**: 191 (1938).

R. indicus (non Thunb. 1813) Leschen. in DC., Prodr. **2**: 568 (1825).

R. pilocalyx O. Kuntze, Meth. Sp. Rubus 70 (1879).

R. excurvatus O. Kuntze, Meth. Sp. Rubus 71, fig. on p. 51 (1879).

Murhay and Sinduwa, 2100 m (Oct. 23, 1963, fr.); Taplejung–Garhi Danra, 1900–2200 m (Nov. 3, 1963); Iladanda–Helok (Nov. 13, 1963); Ghatte–Khebang, 1600–2400 m (Nov. 19, 1963, fr.); Yektin–Akasay, 1600–2300 m (Nov. 30, 1963); Mai Majuwa–Dhara Pani, 1400 m (Dec. 4, 1963, fr.).

Distr. Nepal, Khasia, Assam, N. Burma, Cambodge, and W. China (Yunnan).

This species is distinguished from *R. acuminatus*, in having shorter acuminate leaves with about 10 lateral veins and shorter petioles, albo-tomentose inflorescences and calyces, and fruits black in full mature. The pistils are about 15, and hairy. The specimens cited above are variable in the size and shape of leaves and flowers.

Rubus lineatus Reinwardt in Blume, Bijdr. 1108 (1826)–Fl. Brit. Ind. **2**: 333 (1878), cum var. l. *angustifolia*–O. Kuntze, Rev. Gen. Pl. **1**: 221 (1891)–Focke, l.c. **17** (72): 47 (1910); **19** (83): 24 (1914), f. *angustifolia*.

Baroya Khimty, 2500 m (Nov. 12, 1963, fr.); Diorali Bhanjang–Bhandukay, 2700 m (Nov. 14 & 17, 1963, fr.); Gatribas–Tonglu, 2800–3000 m (Sep. 17, 1964, defl.).

Distr. Himalaya (Nepal to NEFA), Tonkin, W. China, and E. Indies.

R. phengodes Focke (1910) has leaves similar to *R. splendidissimus* but has branches and petioles only with short stipitate glands, less effuse axillary inflorescences, and eglandular calyces. It may be a hybrid between *R. lineatus* and *R. splendidissimus*, or it may fall within the variations of *R. splendidissimus*.

Rubus macilentus Cambessedes in Jacquemont, Voy. 49, t. 60 (1844)–Fl. Brit. Ind. **2**: 336 (1878)–Focke, l.c. **17** (72): 166 (1911).

Palmajua–Rimbick, 2000 m (May 5, 1960, fl.).

Distr. Himalaya (Hazara to NEFA), and W. China.

Rubus niveus Thunberg, Diss. Rubo 9, f. 3 (1813)–Focke in Bibl. Bot. **17** (72): 182 (1911).

R. lasiocarpus Smith in Rees, Cyclop. **30**: no. 6 (1819)–Fl. Brit. Ind. **2**: 339 (1878).

R. distans D. Don, Prodr. Fl. Nepal. 256 (1825).

Mani Bhanjang–Batasi, 2000 m (May 1, 1960, no. 1, fl. rose-purple).

var. **rosaefolius** (Hook. f.) Hara, comb. nov.

R. lasiocarpus var. *rosaefolius* Hook. f., Fl. Brit. Ind. **2**: 339 (1878).

R. niveus var. *rhodophyllos* Focke, l.c. 183 (1911).

Sandakphu–Garibans, 3000 m (Jun. 7, 1960, fl.); Darjeeling, 2000 m (Jun. 24, 1960, fr.); Mangalbare, 2700 m (Oct. 28, 1963).

Distr. sp. Himalaya (Kashmir to Sikkim), S. India, Burma, Thai, Indo-China, and Malaysia.

Rubus nutantiflorus Hara in Journ. Jap. Bot. **40**: 327 (1965).

R. nutans (non Vest 1824) Wallich ex G. Don, Gen. Hist. **2**: 538 (1832)–Edgeworth, l.c. 45 (1846)–Bot. Mag. t. 5023 (1857)–Fl. Brit. Ind. **2**: 334 (1878), cum var. *nepalensis*–Focke, l.c. **17** (72): 39 (1910).

R. barbatus (non Fritsch 1922) Edgeworth in Trans. Linn. Soc. **20**: 46 (1846), in adnota, nom. provis.–Rehder in Journ. Arn. Arb. **23**: 377 (1942); Bibl. 284 (1949).

Iladanda–Selap (Nov. 9, 1963, defl.); Baroya Khimty–Thakma Khola, 2500–3200 m (Nov. 12 & 16, 1963, fl.); Thakma Khola–Diorali Bhanjang, 3200–3400 m (Nov. 14, 1963, fl.); Siling Tzokupa, 3000 m (Nov. 21, 1963).

Distr. Himalaya (Garhwal to Sikkim).

As *R. nutans* Wall. ex G. Don is a later homonym, Rehder in 1942 took up the name *R. barbatus* proposed provisionally by Edgeworth. The latter name, however, is also illegitimate, since it is a later homonym of *R. barbatus* Fritsch (1922).

In their typical forms, *R. nutantiflorus* having robust stems densely covered with purple long setae, laciniate stipules, and obovate petals looks very different from *R. Fockeanus* with slender creeping stems without setae, entire stipules, and narrow petals. *R. nutantiflorus*, however, is very variable, and intermediate forms between both plants are sometimes found.

Focke (1910) classified *R. nutans* and *R. Fockeanus* under different subgenera, but the two species are very closely related each other, and may be proved to be conspecific, when more materials are carefully studied.

Rubus paniculatus Smith in Rees, Cycl. **30**: no. 41 (1819)-Fl. Brit. Ind. **2**: 329 (1878)-Focke, l.c. **17** (72): 72 (1910).

Ghum, 2200m (Jun. 19, 1960, fl.); Darjeeling, 2100m (Jun. 21, 1960, fl.); Tendong Peak, 2750 m (Mar. 26, 1963); Bilbatay Bhanjang-Hati Sar, 2200-2900 m (Oct. 27, 1963, fr.); Baroya Khimty-Thakma Khola, 2500-3200 m (Nov. 12, 1963, fr.); Zongi-Iladanda (Nov. 12, 1963, fr.); Birwa-Yektin, 2000-1600 m (Nov. 28, 1963, fr.); Batasay-Bhuspate Danra, 2400-2800 m (Dec. 1, 1963, fr.); Bhandukay Bhanjang-Mai Majuwa, 3100-1600 m (Dec. 3, 1963, fr.).

Dist. Himalaya (Rajaori to Sikkim), and Khasia.

Rubus pedunculosus D. Don, Prodr. Fl. Nepal. 234 (1825)-Rehder, Bibl. 288 (1949).

R. gracilis (non Presl 1822) Roxb. ex DC., Prodr. **2**: 557 (1825); Fl. Ind. ed. 2, **2**: 519 (1832)-Focke, l.c. **17** (72): 190 (1911).

Chia Bhanjang-Phalut, 3100m (Jun. 2, 1960, bud); Sandakphu-Garibans, 2900 m (Jun. 7, 1960, no. 706, fl.).

Distr. Himalaya (Kashmir to Bhutan), and W. China.

Rubus pentagonus Wallich ex Focke, l.c. **17** (72): 145 (1911).

R. alpestris Blume sensu Fl. Brit. Ind. **2**: 332 (1878).

Batasi-Palmajua, 2300-2600 m (May 3, 1960, no. 67, fl.); Palmajua-Rimbick, 2000 m (May 5, 1960, fl.); Rimbick-Ramam, 1900-2400 m (May 7, 1960, fl.); Sandakphu-Garibans, 3000-2800 m (Jun. 7, 1960, fl.); Baroya Khimty-Thakma Khola, 2500-3200 m (Nov. 12, 1963, fr.).

Distr. Himalaya (Garhwal to Sikkim), N. Burma, and W. China (Yunnan).

Rubus reticulatus Wallich ex Hooker f., Fl. Brit. Ind. **2**: 331 (1878)-Focke, l.c. **17** (72): 92, f. 38 (1910).

Baroya Khimty-Thakma Khola, 2500-3200 m (Nov. 16, 1963, fr.).

Distr. Himalaya (Kumaon to Sikkim).

Rubus rosaefolius Smith, Icon. Ined. **3**: t. 60 (1791)-Fl. Brit. Ind. **2**: 341 (1878)-Focke, l.c. **17** (72): 153 (1911).

f. **coronarius** (Sims) O. Kuntze, Rev. Gen. Pl. **1**: 224 (1891), sub *R. rosifolius γ. normalis*.

R. coronarius Sims in Bot. Mag. t. 1783 (1816)-Bailey in Gen. Herb. **6**: 327, f. 166 & 167 c (1944).

R. rosaefolius f. *coronarius* (Sims) Focke, l.c. 155 (1911)-Rehder, Bibl. 287 (1949).

Gangtok, cult., 1600 m (Apr. 1960; cult. in Tokyo, 1965, fl.).

Distr. sp. Himalaya, India, Indo-China, Malaysia, and S. China.

Rubus splendidissimus Hara in Journ. Jap. Bot. **40**: 327 (1965).

R. Andersoni Hooker f., Fl. Brit. Ind. **2**: 333 (1878)-Focke, l.c. **17** (72): 48 (1910);

non *R. Andersonii* Lefèv. (1877).

Senchal, 2300–2500 m (Jun. 23, 1960, fl.; Dec. 27, 1963); Sandakphu-Garibans, 2800–3500 m (Jun. 7, 1960, fl.); Baroya Khimty, 2500 m (Nov. 11, 1963); Diorali Bhanjang, 3000 m (Nov. 14 & 17, 1963, fr.); Siling Tzokupa, 2900 m (Nov. 21, 1963, fr.).

Distr. E. Himalaya (Nepal, Sikkim).

Rubus sumatranus Miquel, Fl. Ind. Bat. Suppl. 307 (1861)–Merrill in Contr. Arn. Arb. **8**: 70 (1934)–Rehder in Journ. Arn. Arb. **18**: 43 (1937).

R. sorbifolius Maxim. in Bull. Acad. Sci. St.-Pétersb. **17**: 158 (1871).

R. asper Wall. sensu Focke, l.c. **17** (72): 157, f. 67 (1911).

R. rosaefolius subsp. *sumatranus* (Miq.) Focke, l.c. 155 (1911).

Near Saramsa, 1100 m (Mar. 21, 1963, fl.).

Distr. E. Himalaya (Sikkim), Assam, Thai, Indo-China, W. & C. China, Formosa, S. Korea, W. & S. Japan, and Sumatra.

This species with very long capitate glandular hairs was correctly referred to *R. sumatranus* Miquel by Merrill in 1934. The type of Miquel's species which I have examined at Utrecht in 1954 has stems and petioles densely beset with slender glandular hairs up to 4 mm long, and agrees well with *R. sorbifolius* Maxim. of Japan. The petals are smaller than those of *R. asper.*

Rubus Thomsonii Focke in Abh. Nat. Ver. Bremen **4**: 198 (1874); l.c. **17** (72): 144 (1911)–Fl. Brit. Ind. **2**: 332 (1878).

Tendong Peak, 2800 m (Mar. 26, 1963); Bilbatay Bhanjang–Tinjuray, 2800m (Oct. 27, 1963, fr.); Minchin Dhap, 2700–2900 m (Oct. 28, 1963, fr.); Minchin Dhap–Mul Pokhari, 2900–2500 m (Oct. 29, 1963, fr.); Thakma Khola, 2800–3200 m (Nov. 12 & 16, 1963, fr.); below Siling Tzokupa (Nov. 21, 1965, fr.); Bhuspate Danra, 2600 m (Dec. 2, 1963, fr.).

Distr. E. Himalaya (Nepal, Sikkim).

Rubus Treutleri Hooker f., Fl. Brit. Ind. **2**: 331 (1878)–Focke, l.c. **17** (72): 40 (1910).

R. rosulans O. Kuntze, Meth. Sp. Rubus 65 & 78 (1879).

Sandakphu–Garibans, 2800–3500 m (Jun. 7, 1960, no. 705 & 687, fl.); Bilbatay Bhanjang–Hati Sar, 2200–2900 m (Oct. 27, 1963, fr.).

Distr. E. Himalaya (Sikkim, Bhutan), and W. China (N. Yunnan).

Sibbaldia cuneata Hornemann ex O. Kuntze in Linnaea **20**: 59 (1847)–Edgew. in Trans. Linn. Soc. **20**: 44 (1851)–Muravjova in Act. Inst. Bot. Acad. Sci. URSS, ser. 1, **2**: 231 (1931)–Wendelbo in Nytt Mag. Bot. **1**: 40 (1952).

S. parviflora (non Willd. 1799) Edgeworth in Trans. Linn. Soc. **20**: 44 (1846)–Fletcher in Notes Bot. Gard. Edinb. **19**: 217 (1950)–Kitam., Faun. & Fl. Nepal Himal. 160 (1955).

Potentilla Sibbaldi Hooker f., Fl. Brit. Ind. **2**: 345 (1878); non Haller f.

Jongri, 4100m (May 23, 1960, nos. 452 & 458); Gamothang, 3800m (May 27, 1960, fl.; May 29, 1960, no. 569, fl.); Migothang–Nayathang, 3300–3500 m (Jun. 1, 1960).

Distr. Afghanistan, C. Asia, Himalaya, S. E. Tibet, China (Yunnan, Sinkiang), and Formosa.

Sibbaldia micropetala (D. Don) Handel-Mazzetti in Karsten et Schenck, Vegbild. **22** (8): 6 (1932); Symb. Sin. **7**: 520 (1933).

Potentilla micropetala D. Don, Prodr. Fl. Nepal. 231 (1825).

S. potentilloides Cambessedes in Jacquemont, Voy. **4**: 54 (1844).

P. albifolia Wallich [Cat. no. 1018 (1828), nom. nud.] ex Hooker f., Fl. Brit. Ind. **2**: 347 (1878).

Jongri, 4000–4200 m (May 21, 1960, fl.); Jongri–Gamothang, 3800 m (May 29, 1960, fl.).

Distr. Himalaya (Kashmir to Sikkim) and W. China (Yunnan, Szechuan).

Sorbus cuspidata (Spach) Hedlund in Svensk. Vet. Akad. Handl. **35**: 89 (1901)–Stapf in Bot. Mag. t. 8259 (1909).

Crataegus cuspidata Spach, Hist. Nat. Vég. **2**: 106 (1834).

Pyrus vestita Wallich [Cat. no. 679 (1828), nom. nud.] ex Hooker f., Fl. Brit. Ind. **2**: 375 (1878).

Takdah, 1600 m (Apr. 18, 1960, no. 1981, fl.).

Distr. Himalaya (Garhwal to Sikkim).

Sorbus foliolosa (Wall.) Spach, Hist. Nat. Vég. **2**: 96 (1834)–Hedl. in Svensk. Vet. Akad. Handl. **35**: 33 (1901)–Hand.-Mzt., Symb. Sin. **7**: 471 (1933).

Pyrus foliolosa Wallich, Pl. Asia. Rar. **2**: 81, t. 189 (1831), p.p.–Hook. f., Fl. Brit. Ind. **2**; 376 (1878), p.p.

Pyrus Wallichii Hooker f., Fl. Brit. Ind. **2**: 376 (1878).

Photinia foliolosa (Wall.) Koehne, Gatt. Pomac. 19 (1890).

Minchin Dhap–Mul Pokhari, 2900–2500 m (Oct. 29, 1963, fr.); Selap–Walunchung Gola, 3000 m (Nov. 10, 1963, fr.); Thakma Khola–Diorali Bhanjang, 3400 m (Nov. 14, 1963).

Distr. E. Himalaya (Nepal, Sikkim).

Sorbus Hedlundi C. K. Schneider, Ill. Handb. Laubh. **1**: 685 (1906); in Fedde, Rep. **3**: 134 (1906)–Spring Fl. Sikkim Himal. f. 121 (1963).

Pyrus Hedlundi (C. K. Schn.) Lacaita in Journ. Linn. Soc. **43**: 468 (1916).

Ramam–Phalut, 3000 m (May 9, 1960, no. 169, fl.); Garibans–Tonglu, 2800 m (Jun. 7, 1960, fl. & fr.); Thakma Khola, 3000 m (Nov. 13, 1963); Thakma Khola–Bhandukay, 3100 m (Nov. 14, 1963); Thakma Khola–Diorali Bhanjang, 3200 m (Nov. 14, 1963); Siling Tzokupa, 3300 m (Nov. 21, 1963, fr.); Bhuspate Danra–Mai Majuwa, 2500 m (Dec. 3, 1963).

Distr. E. Himalaya (E. Nepal to Bhutan).

Sorbus insignis (Hook. f.) Hedlund in Svensk. Vet. Akad. Handl. **35**: 32 (1901).

Pyrus insignis Hook. f., Fl. Brit. Ind. **2**: 377 (1878).

Minchin Dhap–Mul Pokhari, 2900–2500 m (Oct. 29, 1963).

Distr. E. Himalaya (Sikkim).

Sorbus microphylla Decaisne in Nouv. Arch. Mus. Paris **10**: 159 (1874).

Pyrus microphylla Wallich [Cat. no. 676 (1828), nom. nud.] ex Hook. f., Fl. Brit. Ind. **2**: 376 (1878).

Phalut–Chia Bhanjang, 3300m (May 11, 1960, fl.); Bakkim–Jongri, 3500m (May 19, 1960, no. 390, fl.); Jongri–Olothang, 3700 m (May 23, 1960, fl.); Migothang, 3900 m (May 31, 1960, no. 594, fl.).

Distr. E. Himalaya (Sikkim), and W. China (Szechuan).

Sorbus rhamnoides (Decne.) Rehder in Pl. Wilson. **2**: 278 (1915).

S. sikkimensis var. *oblongifolia* Wenzig in Linnaea **38**: 59 (1874).

Micromeles rhamnoides Decaisne in Nouv. Arch. Mus. Paris **10**: 159 (1874).

Sandakphu-Kala Pokhari, 3500–3000 m (Jun. 7, 1960, no. 688, fl.); Senchal, 2400m (Jun. 23, 1960, fl.); Bilbatay Bhanjang-Hati Sar, 2200–2900 m (Oct. 27, 1963); Thakma Khola-Diorali Bhanjang, 3200–3500 m (Nov. 14, 1963).

Distr. E. Himalaya (Nepal, Sikkim).

Sorbus ursina Decaisne in Nouv. Arch. Mus. Paris **10**: 159 (1874).

S. foliolosa var. *ursina* Wenzig in Linnaea **38**: 75 (1874).

P. foliolosa Wallich sensu Hooker f., Fl. Brit. Ind. **2**: 376 (1878), p.p.

Phalut-Chia Bhanjang, 3200m (May 11, 1960, fl.); Bakkim-Jongri, 3600m (May 19, 1960, fl.); Gamothang, 3800 m (May 27, 1960, fl.); Migothang-Nayathang, 3500m (Jun. 1, 1960, nos. 716 & 729, fl.); Garibans-Tonglu, 2800 m (Jun. 7, 1960, fl.).

Distr. Himalaya (Kumaon to Sikkim).

Spiraea arcuata Hooker f., Fl. Brit. Ind. **2**: 325 (1878)–Rehder, Man. ed. 2, 331 (1940); Bibl. 224 (1949).

Jongri, 4000–4200 m (May 21, 1960, bud); Jongri-Olothang, 3900 m (May 23, 1960, old fr.);.

Distr. Himalaya (Garhwal to Sikkim), N. Burma, and W. China (Szechuan, Yunnan).

Spiraea bella Sims in Bot. Mag. t. 2426 (1823)–Fl. Brit. Ind. **2**: 324 (1878)–Rehder, Man. ed. 2, 336 (1940); Bibl. 227 (1949)–Spring Fl. Sikkim Himal. f. 126 (1963).

Chia Bhanjang-Dentam, 3100–2500m (May 11, 1960, no. 182, fl. ♂); Phalut, 3500m (Jun. 5, 1960, bud); Phalut-Sandakphu, 3500 m (Jun. 6, 1960, no. 669, fl. ♂ & ♀); Sandakphu-Garibans, 3500–2800 m (Jun. 7, 1960, fl. & Sep. 17, 1963, fr.).

Distr. Himalaya (Sirmore to NEFA), and W. China (Yunnan).

So far as our collections are concerned, the flowers are always unisexual and deep pink-rose, and the leaves are serrate from below the middle, although variable in other respects. (See a note on page 637).

No. 669 collected on the Singalila ridge has smaller corymbs generally on short lateral branches along spreading angulate branches of the previous year, and has smaller leaves 1–3 cm long and argutely serrate, whereas no. 182 below the ridge has corymbs on longer upright terete branches, and has larger more hairy leaves 5–7 cm long, and more simply serrate. *S. fastigiata* Wall. ex Schneid. (*S. amoena* Spae) seems to be not specifically distinguished from *S. bella.*

Spiraea micrantha Hooker f., Fl. Brit. Ind. **2**: 325 (1878)–Rehder, Man. ed. 2, 336 (1940).

S. japonica var. *himalaica* Kitamura in Act. Phytotax. Geobot. **15**: 160 (1954); Faun. & Fl. Nepal Himal. 161 (1955).

Victoria Fall, Darjeeling, 1900 m (Apr. 3 & Jun. 18, 1960, fl. white); Palmajua-Rimbick, 2300–2200 m (May 5, 1960, old fr.); below St. Paul School, 2150 m (Jun. 24, 1960, fl.); Bilbatay Bhanjang-Hati Sar, 2200–2900 m (Oct. 27, 1963, fr.); Hati Sar-Minchin Dhap, 2700–2900 m (Oct. 28, 1963, fr.); Minchin Dhap-Mul Pokhari, 2900–2500 m (Oct. 29, 1963, fr.); Garhi Danra-Tuwa, 2200–1800 m (Nov. 4, 1963, fr.); Tuwa-Taplethok, 1800–1400 m (Nov. 5, 1963, fl. & fr.); Taplethok-Helok, 1400–1500 m (Nov. 6, 1963, fl.); Helok, 1500 m (Nov. 8, 1963, fl.); Helok-Iladanda (Nov. 8, 1963, fl.); above Lelep (Nov. 9, 1963, fl.); Walunchung Gola-Zongi, 3800–2800 m (Nov. 11, 1963, fl.); Ghatte-Khebang, 1600–2400 m (Nov. 19, 1963, fr.).

Distr. E. Himalaya (Nepal to Bhutan), Khasia, and Manipur.

Although the degree of pubescence on leaves and follicles is variable, the species is specifically separated from *S. japonica* L. f. of Japan (see a note on page 637).

LEGUMINOSAE (by Hiroyoshi Ohashi)

Abrus fruticulosus Wallich [Cat. no. 5820 (1831–32), nom. nud.] ex Wight et Arnott, Prodr. **1**: 236 (1834)–Baker in Hook. f., Fl. Brit. Ind. **2**: 176 (1876)–Breteler in Blumea **10**: 612 (1960).

A. laevigatus E. Meyer, Comm. **1**: 126 (1836).

A. pulchellus Wallich [Cat. no. 5819 (1831–32), nom. nud.] ex Thwaites, Enum. Pl. Zeyl. 91 (1859)–Fl. Brit. Ind. **2**: 175 (1876).

Nissim-Dumhan, 1500–700 m (Oct. 30, 1963, fr.); Khebang-Bharomdin, 1700–1000 m (Nov. 24, 1963, fr.); Tharpu-Chyangthaphu, 1200–1100 m (Nov. 26, 1963, fr.); Yektin, 1100 m (Nov. 29, 1963, fr.); Ranga Pani-Ghorwa, 700–300 m (Dec. 9, 1963, fr.); Ghorwa-Sanichare, 300–200 m (Dec. 10, 1963, fr.).

Distr. Pantropic.

Acacia Catechu (L. f.) Willdenow, Sp. Pl. **4**: 1079 (1806)–Fl. Brit. Ind. **2**: 295 (1878).

Mimosa Catechu L. f., Suppl. Pl. 439 (1781).

Dhara Pani-Dhankuta, 500 m (Oct. 17, 1963, fr.).

Distr. Himalaya (Punjab to Bhutan), India, N. Burma, Thai, and W. China (Yunnan).

Acacia Intsia (L.) Willdenow, Sp. Pl. **4**: 1091 (1806).

var. **oxyphylla** Baker in Fl. Brit. Ind. **2**: 297 (1878).

Bharomdin-Tharpu, 700–1200 m (Nov. 25, 1963, fr.).

Distr. var. E. Himalaya (Nepal, Sikkim) and W. China (Szechuan).

This variety differs from its mother species in the shape, texture, and number of leaflets.

Acacia pennata (L.) Willdenow, Sp. Pl. **4**: 1090 (1806)–Fl. Brit. Ind. **2**: 297 (1878)–Prain in Journ. Asia. Soc. Beng. **66** (2): 250 et 510 (1897)–Merr. in Philip. Journ. Sci. **5**: 29 (1910).

Mimosa pennata L., Sp. Pl. ed. 1, 522 (1753).

Bharomdin-Tharpu, 700–1200 m (Nov. 25, 1963, fr.).

Distr. Tropical Africa, Himalaya (Kumaon to Bhutan), India, Ceylon, Burma, Thai, Malaysia, and W. China (Yunnan, Szechuan, Hainan).

Aeschynomene asper L., Sp. Pl. ed. 1, 713 (1753)–Fl. Brit. Ind. **2**: 152 (1876)–Rudd in Reinwardtia **5**: 29 (1959).

Mahara Bahara-Kathgara, 200 m (Dec. 13, 1963, fr.); Kathgara-Rangali, 200 m (Dec. 14, 1963, fr.).

Distr. Africa, tropical Himalaya, India, Ceylon, Burma, Thai, Indo-China, and Malaysia.

Aeschynomene indica L., Sp. Pl. ed. 1, 713 (1753)–Fl. Brit. Ind. **2**: 151 (1876)–Rudd, l.c. 30 (1959).

Chobar Gorge, Kathmandu, 1200 m (Sep. 21, 1963, fr.); Biratnagar, 200m (Oct. 14, 1963, fr.); Sanichare–Sibganja, 200 m (Dec. 11, 1963, fr.); Mahara Bahara–Kathgara, 200 m (Dec. 13, 1963, fr.); Kathgara–Rangali, 200 m (Dec. 14, 1963, fr.).

Distr. S. E. United States (probably native), but introduced widely in tropical, subtropical and warm temperate Africa, Asia, and Australia.

The plants from the localities cited above well agree with those from Japan in both morphologically and ecologically. In Japan, also, this species grows in wet lowlands, rice paddies, etc.

Albizia chinensis (Osbeck) Merrill in Amer. Journ. Bot. **3**: 575 (1916).

Mimosa chinensis Osbeck, Dagbok Ostind. Resa 233 (1757).

M. stipulata Roxburgh [Hort. Beng. 40 (1814), nom. nud.] Fl. Ind. ed. 2, **2**: 549 (1832), ut *stipulacea.*

A. stipulata Boivin in Encycl. Méth. **19** (2): 33 (1838)–Benth. in Trans. Linn. Soc. **30**: 568 (1875)–Fl. Brit. Ind. **2**: 300 (1878).

Garhi Danra–Tuwa, 2200–1800 m (Nov. 4, 1963, fr.); Tuwa–Taplethok, 1800–1300 m (Nov. 5, 1963, fr.).

Distr. Himalaya (Kumaon to Sikkim), India, Ceylon, Burma, Inco-China, Malaysia, and S. China (Yunnan, Kwangsi, Kwangtung, Hainan).

Albizia Gamblei Prain in Journ. Asia. Soc. Beng. **66** (2): 513 (1897); in Ann. Bot. Gard. Calcut. **9**: 31, t. 41 (1901)–Brandis, Ind. Tr. 270 (1906).

Below Siling Tzokupa–Khebang, 2100–1700 m (Nov. 22, 1963, fr.); Illam–Ranga Pani, 1200–700 m (Dec. 8, 1963, fr.).

Distr. Himalaya (Kangra to Sikkim), Naga Hills, and W. China (Yunnan).

Albizia Julibrissin Durazzini in Mag. Tosc. **3** (4): 11 (1772)–Fl. Brit. Ind. **2**: 300 (1878)–Prain, l.c. 514 (1897).

Dentam–Pamianchi, 2000 m (May 12, 1960, fl.); Pamianchi–Tingling Bridge, 2000–1000 m (May 15, 1960, fl.); Tingling Bridge–Yoksam, 1000–1700 m (May 16, 1960, fl.); Illam–Ranga Pani, 1200–700 m (Dec. 8, 1963, fr.); Ghorwa–Sanichare, 300–200 m (Dec. 10, 1963, fr.).

Distr. Tropical and warm temperate Asia, and N. Africa.

The Himalayan specimens cited above agree well with the Japanese ones. In Japan this species is found commonly in lowlands.

Albizia Lebbeck (L.) Bentham in Hooker, Lond. Journ. Bot. **3**: 87 (1844), ut *Lebbek*–Fl. Brit. Ind. **2**: 298 (1878)–Merrill in Philip. Journ. Sci. **5**: 23 (1910).

Mimosa Lebbeck L., Sp. Pl. ed. 1, 516 (1753).

Rayang, 250 m (Apr. 21, 1960, no. 1829, fl.).

Distr. Africa, tropical Himalaya, India, Ceylon, Burma, Thai, Indo-China, S. China (Yunnan, Kwangtung), Formosa, Malaysia, and Australia, but now pan tropic.

Albizia lucida (Roxb.) Bentham in Hooker, Lond. Journ. Bot. **3**: 86 (1844)–Fl. Brit. Ind. **2**: 299 (1878).

Mimosa lucida (non Vahl, 1807) Roxburgh [Hort. Beng. 40 (1814), nom. nud.] Fl. Ind. ed. 2, **2**: 544 (1832).

Illam–Ranga Pani, 1200–700 m (Dec. 8, 1963, fr.).

Distr. E. Himalaya (Nepal to N. Assam), Khasia, Burma, Thai, W. China (Yunnan), and Formosa.

The pods of this species are cuspidate at the apex and 15–28 cm long by 4 cm broad at maturity.

Albizia myriophylla Bentham in Hooker, Lond. Journ. Bot. **3**: 90 (1844)–Fl. Brit. Ind. **2**: 300 (1878)–Prain, l.c. 515 (1897).

Dhara Pani–Dhankuta, 900–1200 m (Oct. 17, 1963, fr.).

Distr. E. Himalaya (Nepal, Sikkim), Khasia, Assam, Burma, Thai, Indo-China, and Malaysia.

Alysicarpus rugosus (Willd.) DC., Prodr. **2**: 353 (1825)–Fl. Brit. Ind. **2**: 159 (1876)–Léonard in Bull. Jard. Bot. Brux. **24**: 92, t. 12 (1954)–van Meeuwen in Reinwardtia **6**: 88 (1961)–Schubert in Journ. Arn. Arb. **44**: 296 (1963).

Hedysarum violaceum (non L. 1753) Forskål, Fl. Aegypt.-Arab. 137 (1775).

H. rugosum Willdenow, Sp. Pl. **3**: 1172 (1803).

A. Wallichii Wight et Arnott, Prodr. 234 (1834)–Craib, Fl. Siam. Enum. **1**: 432 (1931).

A. violaceus (Forsk.) Schindler in Fedde, Rep. **21**: 13 (1925), p.p.

Chobar Gorge, south of Kathmandu, 1200 m (Sep. 21, 1963, fl.); Dhara Pani–Dhankuta, 900–1200 m (Oct. 17, 1963, fr.); Sibganja–Gauriganja, 200 m (Dec. 12, 1963, fr.).

Distr. Tropical Africa, Arabia, Himalaya, India, Ceylon, Burma, Thai, Indo-China, ?China (Kwangtung), Malaysia, and N. E. Australia (Queensland).

Alysicarpus vaginalis (L.) DC., Prodr. **2**: 353 (1825)–Fl. Brit. Ind. **2**: 158 (1876)–Prain ex King in Journ. Asia. Soc. Beng. **66** (2): 132 (1897)–Schindl. in Fedde, Rep. Beih. **49**: 257 (1928), p.p.–Léonard, l.c. 84 (1954)–van Meeuwen, l.c. 87 (1961).

Hedysarum vaginale L., Sp. Pl. ed. 1, 746 (1753).

H. nummularifolium (non L. 1753) Willdenow, Sp. Pl. **3**: 1173 (1803).

A. nummularifolius (Willd.) DC., Prodr. **2**: 353 (1825)–Merr., l.c. 92 (1910).

A. vaginalis var. *nummularifolius* (Willd.) Miquel, Fl. Ind. Bat. **1**: 232 (1855)–Fl. Brit. Ind. **2**: 158 (1878).

Dhara Pani–Dhankuta, 900–1200 m (Oct. 17, 1963, fr.); Sibganja–Mahara Bahara, 200 m (Dec. 12, 1963, fr.).

Distr. Tropical and subtropical Africa, Asia, Australia, Polynesia, and introduced in tropical America.

Amphicarpaea bracteata (L.) Fernald in Rhodora **35**: 276 (1933), ut *Amphicarpa*–Fassett in Rhodora **38**: 95 (1936)–Turner et Fearing in Southwest. Naturalist **9**: 215 (1964).

Glycine bracteata L., Sp. Pl. ed. 1, 754 (1753).

subsp. **Edgeworthii** (Benth.) Ohashi, comb. nov.

A. Edgeworthii Bentham in Miquel, Pl. Jungh. 231 (1852)–Fl. Brit. Ind. **2**: 181 (1876)–Hand.-Mzt., Symb. Sin. **7**: 578 (1933)–Turner et Fearing, l.c. 212 (1964).

Falcata Edgeworthii (Benth.) O. Kuntze, Rev. Gen. Pl. **1**: 182 (1891).

Godavari, Kathmandu, 1500 m (Sep. 18, 1963, fl.).

Distr. subsp. Himalaya (Simla and C. Nepal), China (Yunnan, Hainan, and the eastern parts), Korea, Manchuria, Ussuri, and Japan.

In the Himalayan Mountains, this plant has thus far been known only from the western part, and our specimen may be a new record from Eastern Himalaya.

The Asiatic species, *A. Edgeworthii*, and the American one, *A. bracteata*, are closely related and both species have been reported as dipioid (2n=20), though exceptionally a tetraploid count (2n=40) obtained from a Japanese material, and gross morphological differences between them are found merely in the shape of bracts and the shape and length of calyx-lobes (Turner and Fearing, 1964). The bracts of inflorescence in *A. Edgeworthii* are broadly ovate, acute or obtuse at the apex and widest below the middle, while those of *A. bracteata* are broadly obovate, obtuse at the apex, often with minute teeth and widest at or above the middle. The calyx-lobes of the former are usually linnear-lanceolate or rarely lanceolate, attaining usually 2–3 mm in length, but those of the latter are, on the other hand, deltoid or rarely lanceolate, their size ranging 1–2 mm long (Fig. 17).

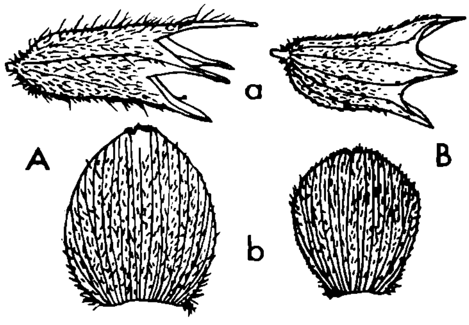

Fig. 17. Calyx (a) and bract of inflorescence (b) in *Amphicarpaea bracteata* (B) and subsp. *Edgeworthii* (A). ×3.

The area of distribution of *A. Edgeworthii* is restricted to E. China, Korea, Japan and its neighbourhood, W. China, Hainan, and Himalaya, whereas that of *A. bracteata* is confined to North America and it is also disjunctively found on Mt. Orizaba in southern Mexico (cf. Turner & Fearing, l.c.).

These characters, though further studies on the cytological relationships between them are much needed, seem to be insufficient to separate the Asiatic plant, *A. Edgeworthii*, as an independent species and it may better be regarded as a geographical subspecies of the American plant, *A. bracteata.*

In Asia, *A. bracteata* subsp. *Edgeworthii* shows considerable variations in the degree of pubescence, shape of the leaflets, and flower colors, and three varieties have so far been recognized, i.e., '*Edgeworthii*' s. str. from Himalaya and W. China (Yunnan), '*japonica*' from Manchuria, E. China, Korea, and Japan, and '*trisperma*' from Ussuri, Manchuria, E. China, Korea, and Japan. The typical '*Edgeworthii*' has usually retrorse, tawny hairy stems, membranous, adpressed pubescent or nearly glabrous leaves, pale green beneath, rhombate terminal leaflets with usually acute apex, and purple flowers. The race '*japonica*' differs slightly from the former usually in having retrorse, sordid or tawny hairs on stems, most commonly thick and rather densely pubescent leaves with acute or obtuse apex, and pale mauve flowers. In the original description (Oliver, 1867), this race, as a variety of *A. Edgeworthii*, was distinguished from '*Edgeworthii*' s. str. by having the obtuse apex of terminal leaflets, but this character can not be used for diagnosis because it shows continuous variation (Pl. 21 a–h). Compared with '*Edgeworthii*' and '*japonica*', the race '*trisperma*' has a tendency to have retrorse, adpressed, tawny pubescent stems, more membranaceous, slightly shorter-hairy leaves, glaucous beneath, sometimes slightly elongated apex of terminal leaflets, and mauve flowers.

These races of subsp. *Edgeworthii* are easily recognizable in their typical forms, but the differences between them are not always sharp, especially in so far as examined in the herbarium materials. In Japan, subsp. *Edgeworthii* is very common in sunny grasslands, roadsides, thicket-margins, etc., and, according to Ohwi (1953), its race '*japonica*' is found mainly in central and western Honshu, Shikoku, and Kyushu, while the other race '*trisperma*' occurs more abundantly in northern Honshu, Hokkaido, and rarely in Kyushu. However, both races are often met with together even in the same habitat and a series of intermediate forms between the two races are found. Both spreading and adpressed hairs are often observed even in different parts of the stems of the same plant (Pl. 21 f–h), and, furthermore, the apex-shape of terminal leaflets vary considerably in different leaves of the same individual (Pl. 21 c–d). In Manchuria, China, and Korea, both races are distributed and intermediate forms are also found. Because of their somewhat continuous variability observed in several gross morphological characters, such forms with some phenotypic difference could at best be regarded as belonging the same variant of the single species. The typical '*Edgeworthii*' differs from '*japonica*' (including '*trisperma*') in the degree of pubescence and color of the flower, occupying distinct geographical areas. Although, as mentioned above, gross morphological differences between '*Edgeworthii*' and '*japonica*' (including '*trisperma*') are trivial, both could taxonomically be regarded as varieties, i.e., var. *Edgeworthii* and var. *japonica*.1)

Recently Chun and T. Chen (1958) described *Amphicarpaea linearis* from Hainan, S. China, based on a single specimen without bearing pods. Though it was circumscribed as a distinct species, they also postulate this new species, *A. linearis*,

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1) The names and synonymy of the races of subsp. *Edgeworthii* are as follows:

Amphicarpaea bracteata (L.) Fernald
subsp. **Edgeworthii** (Benth.) Ohashi
var. **Edgeworthii**
Distr. Himalaya and W. China (Yunnan).
var. **japonica** (Oliver) Ohashi, comb. nov.

Glycine monoica L. sensu Thunberg, Fl. Jap. 283 (1784).

G. javanica (non L. 1753) Thunberg in Trans. Linn. Soc. **2**: 340 (1794).

A. Edgeworthii var. *japonica* Oliver in Journ. Linn. Soc. **9**: 164 (1867)–Maxim. in Mél. Biol. **9**: 69 (1873)–Franch. et Savat., Enum. Pl. Jap. **1**: 107 (1875)–Forbes et Hemsl. in Journ. Linn. Soc. **23**: 188 (1887)–Taubert in Engl., Pfl.-fam. III, **2**: 359 (1891)–Diels in Engl., Bot. Jahrb. **29**: 417 (1901)–Matsum. in Bot. Mag. Tokyo **16**: 84 (1902)–Ohwi, Fl. Jap. 694 (1953); Fl. Jap. ed. rev. 809 (1965).

Shuteria trisperma Miquel in Ann. Mus. Bot. Lugd.-Bat. **3**: 51 et Prol. Fl. Jap. 239 (1867).

A. trisperma (Miq.)Baker ex Jackson, Index Kew. **1**: 111 (1893).

Falcata japonica (Oliver) Komarov in Act. Hort. Petrop. **22**: 630 (1903); Fl. Mansh. 630 (1904)–Bobrov in Fl. URSS. **13**: 527 (1948).

F. comosa var. *japonica* (Oliver) Makino in Bot. Mag. Tokyo **20**: 82 (1906)–Makino et Nemoto, Fl. Jap. ed. 2, 569 (1931).

A. Edgeworthii var. *japonica* f. *aidzuensis* Matsuda in Bot. Mag. Tokyo **25**: (371) (1911).

A. japonica (Oliver) Fedtschenko in Act. Hort. Petrop. **31**: 155 (1912).

A. Edgeworthii var. *trisperma* (Miq.) Ohwi, Fl. Jap. 694 et in Bull. Sci. Mus. Tokyo no 33, 77 (1953); Fl. Jap. ed. rev. 809 (1965).

A. linearis Chun et T. Chen ex Chun et How in Act. Phytotax. Sinica **7**: 23 (1958).

Distr. Hainan, E. China, Korea, Manchuria, Ussuri, and Japan.

to be closely related to *A. Edgeworthii* s. lat. According to their original description and the photo of the type specimen, the species described is characterized by having subrhombate leaflets with gradually acuminate apex, their surface densely reticulate-veined beneath, and subscariose, oblong bracts attaining about 4 mm long. This species, however, falls apparently within what appears to be the variation range of *A. bracteata* subsp. *Edgeworthii.* Moreover, one or more of the diagnostic characters of *A. linearis* mentioned above are also occasionally found in var. *japonica.* Accordingly, I consider that *A. linearis* is not separable from subsp. *Edgeworthii* in its gross morphology but at best be referred to a form of var. *japonica.*

Apios carnea (Wall.) Bentham ex Baker in Fl. Brit. Ind. **2**: 188 (1876)–Merr. in Journ. Arn. Arb. **23**: 169 (1942).

Cyrtotropis carnea Wallich, Pl. Asia. Rar. **1**: 50, t. 62 (1829).

Iladanda–Selap, 1800–2600 m (Nov. 9, 1963, fr.); above Lelep, 2600 m (Nov. 9, 1963, fr.); Baroya Khimty–Thakma Khola, 2500–3100 m (Nov. 12 & 16, 1963, fr.) below Siling Tzokupa–Siling Tzokupa 2100–3800 m (Nov. 21, 1963, fr.); Batasay–Bhuspate Danra, 2400–2900 m (Dec. 1, 1963, fr.).

Distr. Himalaya (Nepal), Khasia, Burma, Thai, Indo-China, and W. China (Yunnan, Kwangtung).

This species is extremely variable in the degree of pubescence on leaves, calyces, and pods. Our specimens, moreover, differ from the typical form of this species in a variation range of the length of the pod, 12–16.5 cm against 10–13 cm.

Astragalus stipulatus D. Don ex Sims in Bot. Mag. n. s. **8**: t. 2380 (1823)–Fl. Brit. Ind. **2**: 131 (1876).

Baroya Khimty–Thakma Khola, 2400–2600 m (Nov. 12, 1963, fr.); Zongi–Iladanda, 2600–1800 m (Nov. 12 & 16, 1963, fr.); Tharpu–Chyangthaphu, 1200–1100 m (Nov. 26, 1963, fr.).

Distr. E. Himalaya (Nepal, Sikkim).

Astragalus xiphocarpus Bentham ex Bunge in Mém. Acad. Sci. St.-Pétersb. ser. 7, **11** (16): 27 (1868) et **15** (1): 33 (1869)–Fl. Brit. Ind. **2**: 129 (1876).

Phalut–Sandakphu, 3500 m (Jun. 6, 1960); Garibans–Tonglu, 2800–3000 m (Jun. 7, 1960); Sandakphu–Gatribas, 3500–2800 m (Sep. 17, 1964, fr.); Bilbatay Bhanjang–Hati Sar, 2200–2700 m (Oct. 27, 1963, fl. & fr.); Hati Sar–Minchin Dhap, 2700–2800 m (Oct. 28, 1963); Minchin Dhap–Mul Pokhari, 2800–2400 m (Oct. 29, 1963, fl. & fr.).

Distr. E. Himalaya (E. Nepal, Sikkim).

Atylosia mollis Bentham in Miquel, Pl. Jungh. 243 (1852), p.p.–Fl. Brit. Ind. **2**: 213 (1876), p.p.–Prain in Journ. Asia. Soc. Beng. **66** (2): 431 (1897).

Cantharospermum molle (Benth.) Taubert in Engl., Pfl.-fam. III, **2**: 373 (1894), ut *mollis.*

Godavari, Kathmandu, 1500 m (Sep. 18, 1963, fl.); Pouwa, Kathmandu, 1600 m (Oct. 9, 1963, fr.); Dhankuta, 1200 m (Oct. 19, 1963, fl. & Oct. 20, 1963, fl. & fr.); Tharpu–near Chyangthaphu, 1200–1100 m (Nov. 26, 1963, fr.).

Distr. Himalaya (Chamba to Sikkim), and W. China (Yunnan).

Atylosia scarabaeoides (L.) Bentham in Miquel, Pl. Jungh. 245 (1852)–Fl. Brit. Ind. **2**: 215 (1876).

Dolichos scarabaeoides L., Sp. Pl. ed. 1, 726 (1753).

Cantharospermum scarabaeoides (L.) Baillon in Bull. Soc. Linn. Paris **1**: 384 (1883), ut *scarabaeoideum*-Merrill in Philip. Journ. Sci. **5**: 128 (1910).

Dhankuta, 1200 m (Oct. 19, 1963, fr.); Bharomdin-Tharpu, 700-1200 m (Nov. 25, 1963, fr.).

Distr. Himalaya, India, Burma, Thai, Indo-China, Malaysia, Polynesia, S. & W. China (Yunnan, Kweichow, Kwangsi, Kwangtung, Fukien), Formosa, and Ryukyu.

Bauhinia malabarica Roxburgh [Hort. Beng. 31 (1814), nom. nud.] Fl. Ind. ed. 2, **3**: 321 (1832)-Fl. Brit. Ind. **2**: 277 (1878)-Merr. in Philip. Journ. Sci. **5**: 43 (1910).

Piliostigma malabaricum (Roxb.) Bentham in Miquel, Pl. Jungh. 261 (1852)-de Wit in Reinwardtia **3**: 531 (1956).

Sibganja-Mahara Bahara, 200 m (Dec. 12, 1963, fr.); Rangali-Biratnagar, 200 m (Dec. 15, 1963, fr.).

Distr. Himalaya, India, Burma, Thai, and Malaysia.

Bauhinia purpurea L., Sp. Pl. ed. 1, 375 (1753)-Fl. Brit. Ind. **2**: 284 (1878)-Prain in Journ. Asia. Soc. Beng. **66** (2): 180 (1897)-Brandis, Ind. Tr. 258 (1906).

Phusri-Sanguri Bhanjang 450-1200 m (Oct. 16, 1963, fl.); Dhankuta, 1200 m, (Oct. 21, 1963, fl. & fr.); Illam-Ranga Pani, 1200-700 m (Dec. 8, 1963, fr.); Ranga Pani-Ghorwa, 700-300 m (Dec. 9, 1963, fl. & fr.); Ghorwa-Sanichare, 300-200 m (Dec. 10, 1963, fr.); Gauriganja-Rangali, 200 m (Dec. 13, 1963, fl. & fr.); Dharan, 200 m (Dec. 15, 1963, fl.).

Distr. Himalaya, Assam, Khasia, N. Burma, Thai, and S. & W. China (Yunnun, Kwangsi, Hainan, Kwangtung, Fukien).

Among our specimens cited above one collected near Sanguri Bhanjang bears white flowers which is referrable to *B. triandra* Roxburgh [Hort. Beng. 31 (1814), nom. nud.] Fl. Ind. ed. 2, **2**: 320 (1832).

Bauhinia Vahlii Wight et Arnott, Prodr. 297 (1834)-Fl. Brit. Ind. **2**: 279 (1878).

Dumhan-Taplejung, 700-2000 m (Nov. 1, 1963, fr.); Ranga Pani-Ghorwa, 700-300 m (Dec. 9, 1963, fr.).

Distr. Himalaya (Kumaon to Bhutan), and India (Assam, Bihar, and W. Peninsula).

Butea minor Hamilton [in Wallich, Cat. no. 5439 (1831-32), nom. nud.] ex Baker in Fl. Brit. Ind. **2**: 195 (1876).

Phusri-Dhara Pani, 450-900 m (Oct.16, 1963, fr.); Dhara Pani-Dhankuta, 900-1200 m (Oct. 17, 1963, fr.); Ranga Pani-Ghorwa, 700-300 m (Dec. 9, 1963, fr.).

Distr. E. Himalaya (Nepal to Mishmi).

Caesalpinia Bonduc (L.) Roxburgh, Fl. Ind. ed. 2, **2**: 362 (1832)-Dandy et Exell in Journ. Bot. **76**: 179 (1938).

C. Crista L., Sp. Pl. ed. 1, 380 (1753), p.p., quoad syn. Pluk. et Breyn.-Urban, Symb. Antill. **2**: 269 (1900)-Merr. in Philip. Journ. Sci. **5**: 53 (1910); Interpr. Rumph. Herb. Amboin. 260 (1917).

Guilandina Bonduc L., Sp. Pl. ed. 1, 381 (1753)-Skeels in Science n. s. **37**: 922 (1913).

G. Bonducella L., Sp. Pl. ed. 2, 545 (1762).

C. Bonducella (L.) Fleming in Asiat. Research. **11**: 159 (1810)-Fl. Brit .Ind. **2**:

254 (1878)–Prain in Journ. Asia. Soc. Beng. **66** (2): 226 (1897).

Biratnagar, 200 m (Oct. 14, 1963, fr.).

Distr. Pantropic.

Caesalpinia digyna Rottboell in Ges. Naturf. Freunde Neue Schr. **4**: 200 (1803)–Fl Brit. Ind. **2**: 256 (1878).

Dhara Pani–Dhankuta, 900–1200 m (Oct. 17, 1963, fl. & fr.).

Distr. E. Himalaya, India, Ceylon, Burma, Thai, Malaysia, and Indo-China.

Cajanus Cajan (L.) Millspaugh in Field Columb. Mus. Bot. **2**: 53 (1900)–Merr., Enum. Philip. Pl. **2**: 314 (1923)–Ochse, Veg. Dutch E. Ind. 370 (1931)–Kitam. in Land Crop Nepal Himal. 118 (1956).

Cytisus Cajan L., Sp. Pl. ed. 1, 739 (1753).

Cajanus indicus Sprengel, Syst. Veg. **3**: 248 (1826)–Fl. Brit. Ind. **2**: 217 (1876)–Hook. f. in Bot. Mag. ser. 3, **35**: t. 6440 (1879)–Merr. in Philip. Journ. Sci. **5**: 126 (1910).

Dumhan–Taplejung, 700–2000 m (Nov. 1, 1963, fr.); Bharomdin–Tharpu, 1000–1200 m (Nov. 25, 1963, fr.); Tharpu–near Chyangthaphu, 1200–1100 m (Nov. 26, 1963, fr.); Ranga Pani–Ghorwa, 700–300 m (Dec. 9, 1963, fr.); Kathgara–Rangali, 200 m (Dec. 14, 1963, fl. & fr.).

Distr. Probably a native of tropical Asia, but now pantropic.

Campylotropis macrostyla (D. Don) Schindler in Fedde, Rep. **11**: 344 (1912).

var. **eriocarpa** (Royle ex Maxim.) Ohashi, comb. nov.

Lespedeza eriocarpa (non DC. 1825) Royle ex Maximowicz in Act. Hort. Petrop. **2**: 350 (1873), p.p., quoad specim. cit. Griffith, cet. excl.–Fl. Brit. Ind. **2**: 144 (1876), p.p., quoad syn. cit. Royle, cet excl. (fide Schindl. in Fedde, Rep. **11**: 347).

Campylotropis eriocarpa (Royle ex Maxim.) Schindler in Fedde, Rep. **11**: 347 (1912); in Fedde, Rep. Beih. **49**: 260 (1928).

Iladanda–Selap, 1800–2600 m (Nov. 9, 1963, fl.); Helok–Baroya Khimty, 1500–2500 m (Nov. 15, 1963, fl. & fr.).

Distr. E. Himalaya (E. Nepal, Sikkim), Khasia, Assam, and E. Bengal.

Our specimens are referrable to *Campylotropis eriocarpa* Schindl. but it is better to regard it as a variety of *C. macrostyla*, because the characters of both plants show a continuous variation.

Cassia Fistula L., Sp. Pl. ed. 1, 377 (1753)–Fl. Brit. Ind. **2**: 261 (1878)–Merr. in Philip. Journ. Sci. **5**: 47 (1910)–de Wit in Webbia **11**: 207 (1955).

Kathgara–Rangali, 200 m (Dec. 14, 1963, fr.).

Distr. Pantropic.

Cassia mimosoides L., Sp. Pl. ed. 1, 379 (1753)–Fl. Brit. Ind. **2**: 266 (1878)–Prain in Journ. Asia. Soc. Beng. **66** (2): 164 et 477 (1897)–Merr., l.c. 51 (1910)–Steyaert in Bull. Jard. Bot. Bruxell **20** (2): 240, t. 8 (1950)–de Wit, l.c. 283 (1955).

C. angustissima Lamarck, Encycl. Méth. **1**: 650 (1783)–Wight et Arnott, Prodr. **1**: 292 (1834).

Dumhan–Taplejung, 700–2000 m (Nov. 1, 1963, fl. & fr.); Tuwa–Taplethok, 1400 m (Nov. 5, 1963, fr.); Helok, 1500 m (Nov. 7, 1963, fr.).

Distr. Pantropic.

The *Cassia mimosoides* group is exceedingly polymorphic in gross morphology and much critical studies are needed.

Our specimens from Himalaya are referrable to *C. mimosoides* var. *dimidiata* (Buch. ex Roxb.) Baker, which is characterized by having 4–6 stamens in each flower, though typical *C. mimosoides* bears 7–10 stamens in flower. This character, however, varies considerably even in different flowers of the same individual. Even in one individual of our collections cited above, the numbers of stamens vary from four to six, i.e., four stamens or four stamens with one staminode or four stamens with two staminodes, five stamens or five stamens with one staminode, and six stamens or six stamens with one staminode. Therefore, this variation in male organs of *C. mimosoides* may be regarded as infraspecific and the forms with 4–6 stamens could at most be treated at the varietal rank.

In Japan, there occurs one *Cassia* species which was previously considered as conspecific with *C. mimosoides* s. lat., but at present is generally regarded as a distinct species, *C. Nomame* Honda. This Japanese plant has hitherto been distinguished from *C. mimosoides* s. lat. only by the difference of the numbers of stamens in each flower, i.e. *C. Nomame* has usually four stamens. Both species, however, show somewhat similar variability in gross morphology. In *C. Nomame* the numbers of stamens vary from four to five, i.e., four stamens or four stamens with one staminode, and five stamens or rarely five stamens with one staminode. As mentioned above, if there were no other differences between *C. mimosoides* and *C. Nomame*, the difference of the stamen-numbers between both plants is not sufficient to separate them as distinct species. However, so far as the specimens examined in the present study, the consistent differences between *C. mimosoides* and *C. Nomame* are summarized as follows:

C. mimosoides . . . Pods 4–5 cm long, 4–5 mm wide, (13–)15–16(–20)-seeded. Stalks of pods slender, 10–15 mm long. Seeds 2.5–3 mm long, 1.5–2 mm wide (Fig. 18, A).

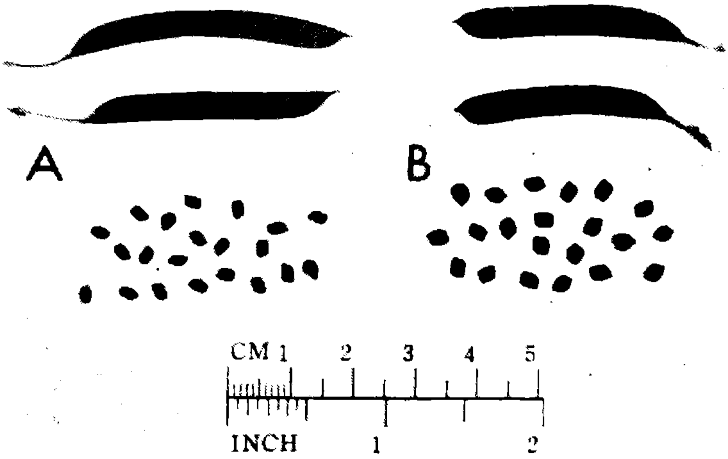

Fig. 18. Pods and seeds of *Cassia mimosoides* (A) and subsp. *Nomame* (B) showing the difference in shape and size of pods, stalks and seeds.

C. Nomame . . . Pods 3–4 cm long, 5–6 mm wide, (8–)10(–12)-seeded. Stalks of pods thick, 6–8 mm long. Seeds 3.5–4 mm long, 2.5–3 mm wide. (Fig. 18, B).

In *C. mimosoides*, however, according to H. C. D. de Wit (in Webbia **11**: 284, 1955), its pods are 2.5–4.5 cm long, about 5 mm wide with 8–14 seeds and the seed-size is about 4 mm long, 2 mm wide. Compared with my conclusions mentioned above, these characters described by de Wit (l.c.) show an intermediate between *C. mimosoides* and *C. Nomame.* Among the specimens examined in the present study, however, the plants with such pod- and seed-size were never been found, though they were quite mature.

C. mimosoides and *C. Nomame* are geographically separated. *C. mimosoides* is distributed circumtropically but probably native to tropical Asia, whereas *C. Nomame* is growing in the temperate and warm temperate areas of E. China, Manchuria, Korea, and Japan. In Ryukyu only the former species is collected. While in Honshu, Shikoku and Kyushu of Japan, only *C. Nomame* is found in sunny dry grassfields of lowlands.

Under the circumstances I am unable at present to maintain *C. Nomame* as specifically distinct and regard it as a geographical subspecies of *C. mimosoides.*[1]

Cassia occidentalis L., Sp. Pl. ed. 1, 377 (1753)–Benth. in Trans. Linn. Soc. **27**: 532 (1871)–Fl. Brit. Ind. **2**: 262 (1878)–Prain, l.c. 474 (1897)–Merr., l.c. 51 (1910)–Steyaert, Fl. Congo Belge **3**: 513 (1952)–de Wit, l.c. 256 (1955).

Senna occidentalis (L.) Roxburgh, Fl. Ind. ed. 2, **2**: 343 (1832).

Ditramexa occidentalis (L.) Britton et Rose in Sci. Surv. Porto Rico **5**: 372 (1925); N. Amer. Fl. **23** (4): 256 (1930).

Dentam–Pamianchi, 1500–2000 m (May 12, 1960, fl.); Biratnagar, 200 m (Oct. 14, 1963, fr.); Dhankuta, 1200 m (Oct. 19, 1963, fr.); Mul Pokhari–Dumhan, 2400–700 m (Oct. 30, 1963, fl. & fr.); Dhara Pani–Illam, 1500–1200 m (Dec. 5, 1963, fr.); Sanichare–Sibganja, 200 m (Dec. 11, 1963, fr.).

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[1] The names of these plants and synonymy are as follows:

Cassia mimosoides L.

subsp. **mimosoides**

Distr. Tropical Asia: Himalaya, India, Ceylon, Burma, Malaysia, Polynesia, Indo-China, S. China (Yunnan, Kweichow, Kwangsi, Kwangtung, Fukien), Formosa, and Ryukyu; Africa; Australia; and America.

subsp. **Nomame** (Sieb.) Ohashi, stat. nov.

C. procumbens (non L. 1753) Thunberg, Fl. Jap. 179 (1784).

Sooya Nomame Siebold, Syn. Pl. Oecon. 56 (1830).

'*C. mimosoides* L. (1753)': Miquel, Prol. Fl. Jap. 242 (1867)–Franch. et Savat., Enum. Pl. Jap. **1**: 115 (1875)–Ito et Matsumura in Journ. Sci. Coll. Imp. Univ. Tokyo **12**: 440 (1899), p.p.–Matsum. in Bot. Mag. Tokyo **16**: 100 (1902), p.p.; Ind. Pl. Jap. **2** (2): 253 (1912), p.p.–Komarov in Act. Hort. Petrop. **22**: 564 (1903)–Nakai in Journ. Coll. Sci. Imp. Univ. Tokyo **26**: 141 (1909).

'*C. mimosoides* var. *dimidiata* (Buch. ex Roxb.) Baker (1878)': Matsumura in Bot. Mag. Tokyo **16**: 100 (1902)–Nakai, l.c. **26**: 142 (1909) et **31**: 464 (1911).

C. mimosoides var. *Nomame* (Sieb.) Makino in Journ. Jap. Bot. **1**: 17 (1917)–Makino et Nemoto, Fl. Jap. ed. 2, 555 (1931).

C. Nomame (Sieb.) Honda, Pl. Sieb. in Siebold Kenkyu 552 (1938); Nom. Pl. Jap. 170 (Jun. 1939)–Kitagawa in Rep. Inst. Sci. Res. Manchuoukuo **3**, App. 1, 283 (Oct. 1939)–Ohwi, Fl. Jap. 673 (1953); Fl. Jap. ed. rev. 784 (1965).

Distr. E. China (Hopeh, Shantung, Shansi), Manchuria, Korea, and Japan (no records in Hokkaido).

Distr. Probably a native of tropical America, but now pantropic.

Cassia Sophera L., Sp. Pl. ed. 1, 379 (1753)-Benth., l.c. 532 (1871)-Fl. Brit. Ind. **2**: 262 (1878)-Prain, l.c. 161 (1897)-de Wit, l.c. 265 (1955).

Biratnagar, 200 m (Oct. 14, 1963, fr.).

Distr. A native of tropical America, but now pantropic.

Cicer arietinum L., Sp. Pl. ed. 1, 738 (1753)-Sims in Bot. Mag. n. s. **7**: t. 2274 (1822)-Fl. Brit. Ind. **2**: 176 (1876)-Kitam. in Kihara, Land Crop. Nepal Himal. 118 (1956).

Sibganja-Gauriganja, 200 m (Dec. 12, 1963, fl.).

Distr. Widely cultivated in N. Africa and Eurasia (except E. Asia); and a native of the Mediterranean region.

Clitoria Ternatea L., Sp. Pl. ed. 1, 753 (1753)-Sims in Bot. Mag. **37**: t. 1542 (1812)-Fl. Brit. Ind. **2**: 208 (1876)-Merr. in Philip. Journ. Sci. **5**: 109 (1910).

Biratnagar, 200 m (Oct. 14, 1963, fl. & fr.).

Distr. Pantropic.

Codariocalyx motorius (Houtt.) Ohashi in Journ. Jap. Bot. **40**: 367 (1965).

Hedysarum motorium Houttuyn, Nat. Hist. II, **10**: 246 (1779).

H. gyrans L. f., Suppl. Pl. 332 (1781).

Desmodium gyrans (L. f.) DC., Prodr. **2**: 326 (1825)-Fl. Brit. Ind. **2**: 174 (1876)-Merrill., Enum. Philip. Pl. **2**: 285 (1923)-Liu et Chuang in Taiwania **8**: 79 (1962).

C. gyrans (L. f.) Hasskarl in Flora **25** (2), Beibl. **2**: 49 (1842)-Schindl. in Fedde, Rep. **20**: 280 (1924)-Hutchinson, Gen. Fl. Pl. **1**: 479 (1964).

Pseudarthria gyrans Hasskarl in Cat. Hort. Bogor. 281 et in Tijd. Nat. Gesch. & Phys. **11**: 104 (1844); Pl. Jav. Rar. 391 (1848).

Meibomia gyrans (L. f.) O. Kuntze, Rev. Gen. Pl. **1**: 196 (1891).

D. motorium (Houtt.) Merrill in Journ. Arn. Arb. **19**: 345 (1938)-van Meeuwen in Reinwardtia **6**: 254 (1962).

Godavari, 1500 m (Sep. 18, 1963, fl.); Kakani, 2100–2200 m (Sep. 24, 1963, fl.); Illam-Ranga Pani, 1200–700 m (Dec. 8, 1963, fr.); Ranga Pani-Ghorwa, 700–300 m (Dec. 9, 1963, fl. & fr.); Ghorwa-Sanichare, 300–200 m (Dec. 10, 1963, fl. & fr.).

var. **Roylei** (Wight et Arn.) Ohashi, l.c. 368 (1965).

D. Roylei Wight et Arnott, Prodr. **2**: 227 (1834).

D. gyrans var. *Roylei* (Wight et Arn.) Baker in Fl. Brit. Ind. **2**: 175 (1876).

C. gyrans var. *Roylei* (Wight et Arn.) Schindler, l.c. 281 (1924).

Tuwa-Taplethok, 1800–1300 m (Nov. 5, 1963, fr.); Tharpu-near Chyangthaphu, 1200–1100 m (Nov. 26, 1963, fr.).

Distr. sp. Himalaya (Hazara to N. Assam), India, Ceylon, Burma, Thai, Indo-China, Malaysia, S. & W. China, Formosa, and tropical Australia.

Crotalaria albida Hyne ex Roth, Nov. Pl. Sp. 333 (1821)-Fl. Brit. Ind. **2**: 71 (1876)-Prain in Journ. Asia. Soc. Beng. **66** (2): 351 (1897)-Merrill in Philip. Journ. Sci. **5**: 61 (1910)-de Munk in Reinwardtia **6**: 200 (1962)-Chuang in Taiwania **9**: 68 (1963).

C. uliginosa Huang in Act. Phytotax. Sin. **6**: 396, t. 60 (1957).

Gangtok, 1700 m (Jun. 13, 1960, fr.); Kakani, 2100–2200 m (Sep. 24, 1963, fl.); Phusri-Dhara Pani, 450–900 m (Oct. 16, 1963, fl. & fr.); Dumhan, 800 m (Oct. 31, 1963, fr.); Dumhan–Taplejung, 700–2000 m (Nov. 1, 1963, fl. & fr.); Garhi Danra–Tuwa, 2200–1800 m (Nov. 4, 1963, fl.); Helok, 1500 m (Nov. 7, 1963, fr.); Khebang-below Siling Tzokupa, 1700–2100 m (Nov. 20 & 22, 1963, fl. & fr.); Tharpu–Chyangthaphu, 1200–1100 m (Nov. 26, 1963, fl.); Birwa–Yektin, 2400–1700 m (Nov. 28, 1963, fl.); Ranga Pani–Sanichare, 700–200 m (Dec. 9, 1963, fr.).

Distr. Himalaya, India, Ceylon, Burma, Thai, Indo-China, Malaysia, S. & C. China, and Formosa.

C. uliginosa from Hainan, S. China, seems to be referrable to *C. albida*. Among our collections cited above there are some plants which are characterized by having one or two flowered inflorescences and smaller flowers. These specimens show apparently an intermediate form between *C. albida* and *C. uliginosa*. Moreover, the flower-size of *C. albida* varies to a considerable extent.

Crotalaria bialata Schrank, Pl. Rar. Hort. Monac. t. 13 (1819).

C. alata Hamilton [in Roxburgh, Hort. Beng. 98 (1814), nom. nud.] ex D. Don, Prodr. Fl. Nepal. 241 (Feb. 1825)–DC., Prodr. **2**: 124 (Nov. 1825)–Fl. Brit. Ind. **2**: 69 (1876)–de Munk in Reinwardtia **6**: 200 (1962).

Dhara Pani–Dhankuta, 900–1200 m (Oct. 17, 1963, fl.); Dhankuta, 1200 m (Oct. 18, 1963, fl. & fr.); Ranga Pani–Ghorwa, 700–300 m (Dec. 9, 1963, fr.).

Distr. Himalaya (Kumaon to Sikkim), Khasia, Assam, Mishmi, Burma, Thai, Indo-China, Malaysia, and W. China (Yunnan).

Crotalaria calycina Schrank, Pl. Rar. Hort. Monac. t. 12 (1819)–DC., l.c. 129 (1825)–Fl. Brit. Ind. **2**: 72 (1876)–de Munk, l.c. 202 (1962)–Chuang, l.c. 72 (1963).

Dhankuta, 1200 m (Oct. 21, 1963, fr.).

Distr. Tropical Africa, Himalaya, India, Ceylon, Burma, Thai, Indo-China, W. & S. China, Formosa, Malaysia, and tropical Australia.

Crotalaria ferruginea Graham [in Wall., Cat. no. 5398 (1831–32), nom. nud.] ex Bentham in Hook. Lond. Journ. Bot. **2**: 476 (1843)–Fl. Brit. Ind. **2**: 68 (1876)–de Munk, l.c. 203 (1962)–Chuang, l.c. 77 (1963).

Pouwa, Kathmandu, 1600 m (Oct. 9, 1963, fl.); Nissim–Dumhan, 1700 m (Oct. 30, 1963, fl. & fr.); Khebang–Bharomdin, 1400 m (Nov. 24, 1963, fr.); Birwa–Yektin, 1900 m (Nov. 28, 1963, fl. & fr.).

Distr. Himalaya (Kumaon to N. Assam), India, Ceylon, Burma, Thai, Malaysia, Indo-China, W. & S. China, and Formosa.

Crotalaria hirsuta Willdenow, Sp. Pl. **3**: 978 (1803)–Fl. Brit. Ind. **2**: 68 (1876).

Phusri–Dhara Pani, 450–900 m (Oct. 16, 1963, fr.); Dhara Pani–Tamur Bridge, 900–300 m (Oct. 17, 1963, fr.); Dhankuta, 1200 m (Oct. 21, 1963, fr.); Ranga Pani–Ghorwa, 700–300 m (Dec. 9, 1963, fr.).

Distr. Himalaya, India, Burma, and Indo-China.

Crotalaria humifusa Graham [in Wall., Cat. no. 5421 (1831–32), nom. nud.] ex Bentham in Hook. Lond. Journ. Bot. **2**: 476 (1843)–Fl. Brit. Ind. **2**: 67 (1876)–de Munk, l.c. 205 (1962).

Dhankuta, 1200 m (Oct. 21, 1963, fl.); Nissim–Dumhan, 1500–700 m (Oct. 30, 1963, fl.); Dumhan by the Tamur River, Taplejung Dist., 700 m (Oct. 31, 1963, fl.); Dumhan–Taplejung, 700–2000 m (Nov. 1, 1963, fl. & fr.); Helok, 1500 m (Nov. 7, 1963, fr.); Helok–Iladanda, 1500–1800 m (Nov. 8, 1963, fl. & fr.).

Distr. Himalaya (Kumaon to Sikkim), India, Burma, Thai, Indo-China, and Malaysia.

Crotalaria mucronata Desvaux in Journ. de Bot. **3**: 76 (1814); in Ann. Sci. Nat. Paris **9**: 407 (1826)–DC., l.c. 132 (1825)–de Munk, l.c. 209 (1962).

C. striata DC., Prodr. **2**: 131 (1825)–Hook. in Bot. Mag. **59**: t. 3200 (1832)–Fl. Brit. Ind. **2**: 84 (1876)–Kaur in Bull. Bot. Gard. Lucknow no. **87**: t. 11 (1964).

C. Saltiana Andrews sensu Prain ex King in Journ. Asia. Soc. Beng. **66** (2): 41 (1897)–Chuang, l.c. 81 (1963).

C. siamica Williams in Bull. Herb. Boissier 2, **5**: 20 (1905).

Gangtok, 1500 m (Jul. 17, 1960, fl.); Rangpo–Tista, 900–350 m (Jul. 18, 1960); Phusri–Dhara Pani, 450–900 m (Oct. 16, 1963, fl. & fr.); Mul Pokhari–Dumhan, 2400–700 m (Oct. 30, 1963, fl. & fr.); Garhi Danra–Tuwa, 2200–1800 m (Nov. 4, 1963, fl. & fr.); Bharomdin–Tharpu, 1000–1200 m (Nov. 25, 1963, fl. & fr.); Sanichare–Sibganja, 200 m (Dec. 11, 1963, fl. & fr.).

Distr. A native of central and tropical America, but now widely introduced in tropical Africa, Asia, and Australia.

Crotalaria quinquefolia L., Sp. Pl. ed. 1, 716 (1753)–Fl. Brit. Ind. **2**: 84 (1876)–de Munk, l.c. 212 (1962).

C. heterophylla L. f., Suppl. Pl. 323 (1781).

Kathgara–Rangali, 200 m (Dec. 14, 1963, fr.).

Distr. Himalaya, India, Burma, Thai, Indo-China, Malaysia, and Australia.

Crotalaria retusa L., Sp. Pl. ed. 1, 715 (1753)–Sims in Bot. Mag. n. s. **10**: t. 2561 (1825)–Fl. Brit. Ind. **2**: 75 (1876)–de Munk, l.c. 212 (1962)–Kaur, l.c. t. 8 & 9 (1964).

Sanichare–Sibganja, 200 m (Dec. 11, 1963, fr.); Sibganja–Mahara Bahara, 200 m (Dec. 12, 1963, fl. & fr.).

Distr. A native of tropical Asia, but now pantropic.

Crotalaria sessiliflora L., Sp. Pl. ed. 2, 1004 (1763)–Fl. Brit. Ind. **2**: 73 (1876)–de Munk, l.c. 214 (1962)–Chuang, l.c. 84 (1963).

Pouwa, Kathmandu, 1400 m (Oct. 9, 1963, fl. & fr.); Dhankuta, 1200 m (Oct. 19, 1963, fl.); Dumhan–Taplejung, 700–2000 m (Nov. 1, 1963, fr.); Tuwa–Taplethok, 1800–1300 m (Nov. 5, 1963, fl.); above Lelep, 2600 m (Nov. 9, 1963, fr.); Tharpu–near Chyangthaphu, 1200–1100 m (Nov. 26, 1963, fr.); Birwa–Yektin, 2400–1700 m (Nov. 28, 1963, fr.); Sanichare–Sibganja, 200 m (Dec. 11, 1963, fl.).

Distr. Himalaya (N. Punjab to N. Assam), India, Burma, Thai, Indo-China, Malaysia, China, Formosa, Ryukyu, Korea, Manchuria, and Japan.

The specimens from Himalaya cited above well agree with those from Japan and its neighbouring areas in gross morphological characters. In Japan, this species is growing in sunny, dry grassland of Honshu (except in northern districts), Shikoku, and Kyushu.

Crotalaria tetragona Andrews, Bot. Rep. 9, t. 593 (1810)–Roxb., Fl. Ind. ed. 2, **3**: 263 (1832)–Fl. Brit. Ind. **2**: 78 (1876)–de Munk, l.c. 215 (1962)–Kaur, l.c. t. 12 (1964).

Dhara Pani–Dhankuta, 900–1200 m (Oct. 17, 1963, fl.); Tharpu-near Chyangthaphu, 1200–1100 m (Nov. 26, 1963, fl. & fr.); Ranga Pani–Ghorwa, 700–300 m (Dec. 9, 1963, fl. & fr.); Ghorwa–Sanichare, 300–200 m (Dec. 10, 1963, fl. & fr.).

Distr. Himalaya (Kumaon to N. Assam), Burma, Thai, Indo-China, and W. China (S. Yunnan).

Dalbergia assamica Bentham in Miquel, Pl. Jungh. 255 (1852)–Fl. Brit. Ind. **2**: 235 (1876), p.p.–Prain in Journ. Asia. Soc. Beng. **66** (2): 449 (1897); in Ann. Bot. Gard. Calcut. **10**: 89, pl. 71 (1904).

Tista, 350 m (Apr. 26, 1960; Apr. 27, 1960, no. 1891, fl.; Jun. 19, 1960, fr.).

Distr. Himalaya (Kumaon to N. Assam), N. Burma, and W. China (Yunnan).

Dalbergia latifolia Roxburgh, Pl. Corom. **2**: 7, t. 113 (1798); Fl. Ind. ed. 2, **3**: 221 (1832)–Fl. Brit. Ind. **2**: 231 (1876)–Kurz in Journ. Asia. Soc. Beng. **45** (2): 280 (1876)–Prain in Ann. Bot. Gard. Calcut. **10**: 80, pl. 62 (1904).

Illam–Ranga Pani, 1200–700 m (Dec. 8, 1963).

Distr. Himalaya (Oudh to Sikkim), India, Indo-China, and Malaysia.

Dalbergia sericea G. Don, Gen. Hist. **2**: 375 (1832)–Prain in Journ. Asia. Soc. Beng. **70** (2): 51 (1901); in Ann. Bot. Gard. Calcut. **10**: 85, pl. 66 (1904).

D. hircina Wallich [Cat. no. 5871 B (1831–32), nom. nud.] ex Bentham in Miquel, l.c. 256 (1851); in Journ. Linn. Soc. **4**, Suppl. 46 (1860)–Fl. Brit. Ind. **2**: 236 (1876)–Prain in Journ. Asia. Soc. Beng. **66** (2): 449 (1897).

D. stenocarpa Kurz in Journ. Asia. Soc. Beng. **44** (2): 205 (1875)–Fl. Brit. Ind. **2**: 238 (1876).

Tingling Bridge–Yoksam, 1000–1700 m (May 16, 1960, no. 332, fl.).

Distr. Himalaya (Garhwal, Kumaon to Bhutan).

Dalbergia Sissoo Roxburgh [Hort. Beng. 53 (1814), nom. nud.] Fl. Ind. ed 2, **3**: 223 (1832)–Fl. Brit. Ind. **2**: 231 (1876)–Prain in Journ. Asia. Soc. Beng. **70** (2): 40 (1901); in Ann. Bot. Gard. Calcut. **10**: 57, pl.. 34 (1904).

Ghorwa–Sanichare, 300–200 m (Dec. 10, 1963, fr.).

Distr. Afghanistan, Himalaya (Simla to N. Assam), and India.

Dalbergia stipulacea Roxburgh [Hort. Beng. 53 (1814), nom. nud.] Fl. Ind. ed. 2, **3**: 233 (1832)–Fl. Brit. Ind. **2**: 237 (1876), p.p.–Prain in Journ. Asia. Soc. Beng. **66** (2): 451 (1897); in Ann. Bot. Gard. Calcut. **10**: 102, pl. 87 (1904).

Illam–Ranga Pani, 1200–700 m (Dec. 8, 1963); Ranga Pani–Ghorwa, 700–300 m (Dec. 9, 1963, fr.); Sibganja–Mahara Bahara, 200 m (Dec. 12, 1963, fr.).

Distr. E. Himalaya (Nepal to Bhutan), Khasia, Assam, Manipur, Burma, Thai, Indo-China, Malaysia, and W. China (Yunnan).

Dendrolobium triangulare (Retz.) Schindler in Fedde, Rep. **20**: 279 (1924).

Hedysarum triangulare Retzius, Observ. Bot. **3**: 40 (1783).

H. Cephalotes Roxburgh [Hort. Beng. 57 (1814), nom. nud.] Fl. Ind. ed. 2, **3**: 360 (1832).

Desmodium Cephalotes (Roxb.) Wight et Arnott, Prodr. 224 (1834)–Fl. Brit. Ind. **2**: 161 (1876)–Prain in Journ. Asia. Soc. Beng. **66** (2): 389 (1897), incl. var. *congestum* (Wight et Arn.) Prain–Liu et Chuang in Taiwania **8**: 74 (1962).

Dendrolobium Cephalotes (Roxb.) Bentham in Miquel, Pl. Jungh. 216 et 218 (1852).

Desmodium triangulare (Retz.) Merrill in Journ. Arn. Arb. **23**: 170 (1942)–van

Meeuwen in Reinwardtia **6**: 261 (1962).

Ranga Pani-Ghorwa, 200 m (Dec. 9, 1963, fr.); Ghorwa-Sanichare, 200 m (Dec. 10, 1963, fr.); Sibganja-Mahara Bahara, 200 m (Dec. 12, 1963, fr.).

Distr. E. Himalaya (Nepal to Chittagong), India, Ceylon, Burma, Thai, Indo-China, W. & S. China, Formosa, Ryukyu, Malaysia, Polynesia, and Africa.

Derris marginata (Roxb.) Bentham in Miquel, Pl. Jungh. 252 (1852); in Journ. Linn. Soc. **4**: Suppl. 111 (1860)-Fl. Brit. Ind. **2**: 245 (1878)-How in Act. Phytotax. Sin. **3**: 218 (1954)-Thothathri in Bull. Bot. Surv. Ind. **3**: 187 (1961).

Dalbergia marginata Roxburgh [Hort. Beng. 53 (1814), nom. nud.] Fl. Ind. ed. 2, **3**: 230 (1832).

Deguelia marginata (Roxb.) Taubert in Engl., Pfl.-fam. III, **2**: 345 (1891).

Garhi Danra-Tuwa, 2200-1800 m (Nov. 4, 1963, fr.).

Distr. E. Himalaya, Khasia, Assam, Bengal, Chittagong, Burma, Thai, Indo-China, and S. China (Yunnan, Kwangsi).

Derris thyrsiflora (Benth.) Bentham in Journ. Linn. Soc. **4**: Suppl. 249 (1860)-Fl. Brit. Ind. 246 (1876)-Prain in Journ. Asia. Soc. Beng. **66** (2): 301 (1897)-Thothathri, l.c. 195 (1961).

Millettia thyrsiflora (Bentham) in Miquel, Pl. Jungh. 249 (1852), in adnot.

Deguelia thyrsiflora (Benth.) Taubert in Engl., Pfl.-fam. III, **2**: 345 (1891).

Peshok, 900 m (Apr. 27, 1960, fl.); Iladanda-Helok, 1800-1500 m (Nov. 13, 1963, fl. & fr.).

Distr. E. Himalaya, Khasia, Assam, Nicobar Isl., Andaman Isl., Thai, Indo-China, and Malaysia.

Desmodium confertum DC. in Ann. Sci. Nat. ser. 1, **4**: 101 (Jan. 1825)-Fl. Brit. Ind. **2**: 167 (1876)-Prain in Journ. Asia. Soc. Beng. **66** (2): 396 (1897).

Hedysarum dioicum Hamilton ex D. Don, Prodr. Fl. Nepal. 244 (Feb. 1825).

D. dioicum (Hamilt. ex D. Don) DC., Prodr. **2**: 338 (Nov. 1825)-Schindl. in Fedde, Rep. Beih. **49**: 273 (1928).

Pouwa, Kathmandu, 1600 m (Oct. 9, 1963, fl.); Phusri-Dhara Pani, 450-900 m (Oct. 16, 1963, fl.); Dhankuta, 1200 m (Oct. 19, 20, & 21, 1963, fl.); Dumhan, Taplejung Dist., 800 m (Oct. 31, 1963, fl.); Garhi Danra-Tuwa, 2200-1800 m (Nov. 4, 1963, young fr.); Khebang, 1400 m (Nov. 23, 1963, fr.); Khebang-Bharomdin, 1700-1000 m (Nov. 24, 1963, fr.); Ranga Pani-Ghorwa, 700-300 m (Dec. 9, 1963, fr.).

Distr. E. Himalaya (Nepal, Sikkim), and Khasia.

Desmodium gangeticum (L.) DC., Prodr. **2**: 327 (1825)-Fl. Brit. Ind. **2**: 168 (1876), incl. var. *maculatum* (L.) Baker-Merrill in Philip. Journ. Sci. **5**: 87 (1910)-Liu et Chuang in Taiwania **8**: 77 (1962)-van Meeuwen in Reinwardtia **6**: 249 (1962).

Hedysarum gangeticum L., Sp. Pl. ed. 1, 746 (1753).

Dhankuta, 1200 m (Oct. 21, 1963, fr.); Dumhan-Taplejung, 700-2000 m (Nov. 1, 1963, fr.); Ranga Pani-Ghorwa, 700-300 m (Dec. 9, 1963, fr.).

Distr. Tropical and subtropical Africa, Asia, Australia, and Polynesia, but now introduced in tropical America.

Desmodium heterocarpon (L.) DC., Prodr. **2**: 337 (1825) ut *heterocarpum*-Merr., Enum. Philip. Pl. **2**: 285 (1923)-Liu et Chuang, l.c. 80 (1962), incl. *D. Buergeri* Miq.-van Meeuwen, l.c. **6**: 95 (1961) & 251 (1962).

Hedysarum heterocarpon L., Sp. Pl. ed. 1, 747 (1753).

H. siliquosum Burman f., Fl. Ind. 169, t. 55, f. 2 (1768).

H. polycarpum Poiret in Lamarck, Encycl. Méth. **6**: 413 (1805).

D. polycarpum (Poir.) DC., Prodr. **2**: 334 (1825)–Fl. Brit. Ind. **2**: 171 (1876) incl. var. *trichocaulon* (DC.) Baker.

D. siliquosum (Burm. f.) DC., Prodr. **2**: 336 (1825)–Schindl. in Fedde, Rep. Beih. **49**: 298 (1928).

D. Buergeri Miquel in Ann. Mus. Bot. Lugd.-Bat. **3**: 45 (1867)–Liu et Chuang, l.c. 71 (1962).

D. polycarpum var. *ovalifolium* Prain ex King in Journ. Asia. Soc. Beng. **66** (2): 141 (1897).

D. ovalifolium Wallich [Cat. no. 5730 (1831–32), nom. nud.] ex Merr. in Philip. Journ. Sci. **5**: 85 (1910)–Schindl. in Fedde, Rep. Beih. **49**: 287 (1928).

D. heterocarpum var. *Buergeri* (Miq.) Hosokawa in Journ. Soc. Trop. Agr. **4**: 201 (1932).

Godavari, Kathmandu, 1500 m (Sep. 18, 1963, fl.); Phusri–Dhara Pani, 450–900 m (Oct. 16, 1963, fl.); Dhara Pani–Dhankuta, 900–1200 m (Oct. 17, 1963, fl.); Dhankuta, 1200 m (Oct. 19, 1963, fl.; Oct. 21, 1963, fr.); Illam–Ranga Pani, 1200–700 m (Dec. 8, 1963, fr.); Ranga Pani–Ghorwa, 700–300 m (Dec. 9, 1963, fr.); Ghorwa–Sanichare, 300–200 m (Dec. 10, 1963, fr.); Sibganja–Mahara Bahara, 200 m (Dec. 12, 1963, fr.).

Distr. Himalaya, India, Burma, Thai, Indo-China, China, Formosa, Ryukyu, Korea (Quelpaert), S. Japan, Malaysia, New Caledonia, and Polynesia.

This species is extremely variable. The specimens collected in sunny, dry areas between Sibganja and Mahara Bahara are characterized by having young shoots and rachises of inflorescence which are densely clothed with brown spreading hairs, while those collected at Dhankuta and between Dhara Pani and Dhankuta have dense white spreading hairs on those parts.

In Japan, this species is found in sunny grassland of Kyushu, Shikoku and eastwards to the Pacific side of central Honshu. The Japanese plant well agrees with the Himalayan one in the shape of stipules, calyces and legumes, but generally differs from it in having more slender and less pubescent branches, lax racemes, and slightly smaller wings and longer keel of the flowers (Fig. 19, E & F). Such a form is also found in some collections from Himalaya, and may be referrable to *D. Buergeri* which has been regarded as a distinct species or a variety or merely a form identical with *D. heterocarpon.* Having examined many specimens from Japan, Himalaya, Ryukyu, Formosa, and other localities, I came to the conclusion that it is difficult to draw sharp lines of demarcation between the Japanese plant and the Himalayan one and between *D. Buergeri* and *D. heterocarpon* because they fall into a continuous range of variation.

Desmodium heterophyllum (Willd.) DC., Prodr. **2**: 334 (1825)–Fl. Brit. Ind. **2**: 173 (1876), excl. syn. cit. *D. caespitosum* DC.–Prain, l.c. 401 (1897)–Merr., l.c. 85 (1910)–Liu et Chuang, l.c. 81 (1962)–van Meeuwen, l.c. 251 (1962).

Hedysarum heterophyllum Willdenow, Sp. Pl. **3**: 1201 (1803).

Sanichare–Sibganja, 200 m (Dec. 11, 1963, fr.).

Distr. E. Himalaya, India, Ceylon, Burma, Thai, Indo-China, Malaysia, New

Caledonia, Micronesia, China, Formosa, and Ryukyu.

Desmodium khasianum Prain in Journ. Asia. Soc. Beng. **66** (2): 395 (1897).

Birwa-below Yektin, 2400–1400 m (Nov. 28, 1963, fr.); below Yektin–Batasay, 1400–2400 m (Nov. 30, 1963, fr.).

Distr. E. Himalaya (E. Nepal), Khasia, and Jaintea Hills.

This collection is a new record from the Himalayan region.

Desmodium kulhaitense C. B. Clarke ex Prain in Journ. Asia. Soc. Beng. **66** (2): 395 (1897)–Ohashi in Journ. Jap. Bot. **40**: 366 (1965).

Penlong La, Gangtok, 2100 m (Sep. 13, 1964, fl. & fr.).

Distr. E. Himalaya (Sikkim).

In the original description of this species, the characters of its flower were not given, so I redescribed this species based on data obtained from the specimens cited above.

Desmodium laxiflorum DC. in Ann. Sci. Nat. ser. 1, **4**: 100 (1825)–Fl. Brit. Ind. **2**: 164 (1876)–Liu et Chuang, l.c. 85 (1962)–van Meeuwen, l.c. 252

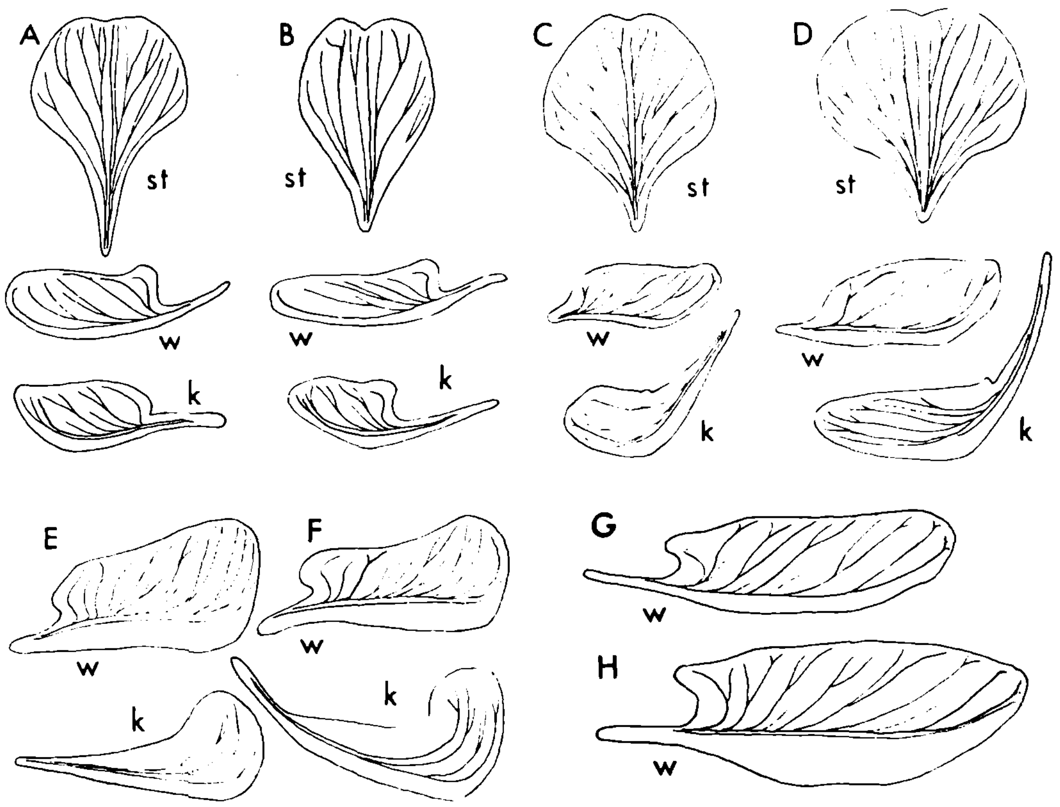

Fig. 19. Variations in shape and size of petals of *Desmodium microphyllum* (A & B), *D. podocarpum* (C & D), *D. heterocarpon* (E & F), and *D. sequax* (G & H). st: standard, w: wing, k: keel. All ×7. A: E. Nepal, Taplethok–Helok; B: S. Japan, Nagasaki; C: E. Nepal, Dhankuta; D: S. Japan, Ehime; E: E. Nepal, Dhara Pani–Dhankuta (the typical form); F: S. Japan, Kagoshima (a form referrable to *D. Buergerii*); G: C. Nepal, Godavari (the typical form); H: Formosa, Kagi (a form referrable to *D. sinuatum*).

(1962).

Kathmandu–Thankot, 1400–1300 m (Sep. 20, 1963, fl.); Kathmandu, 1400 m (Sep. 23, 1963, fl.); Dhara Pani–Dhankuta, 900–1200 m (Oct. 17, 1963, young fr.); Dumhan–Taplejung, 700–2000 m (Nov. 1, 1963, fr.); Ranga Pani–Ghorwa, 700–300 m (Dec. 9, 1963, fr.).

Distr. Himalaya (Garhwal to N. Assam), India, Burma, Thai, Indo-China, China (Yunnan, Szechuan, Sikang, Kweichow, Kwangsi, Kwangtung, Hainan), Formosa, and Malaysia.

Desmodium microphyllum (Thunb.) DC., Prodr. **2**: 337 (Nov. 1825)–Liu et Chuang, l.c. 87 (1962)–van Meeuwen, l.c. 254 (1962).

Hedysarum microphyllum Thunberg, Fl. Jap. 284 (1784).

D. parvifolium DC. in Ann. Sci. Nat. ser. 1, **4**: 100 (Jan. 1825)–Fl. Brit. Ind. **2**: 174 (1876).

H. parvifolium (DC.) Sprengel, Syst. Veg. **4** (2): 293 (1827).

Kakani Hill, northwest of Kathmandu, 2200 m (Sep. 24, 1963, fl.); Pouwa, Kathmandu, 1600 m (Oct. 9, 1963, fl. & fr.); Dhankuta, 1200 m (Oct. 17, 1963; Oct. 19, 1963, fl. & fr.); Taplejung, 1700 m (Nov. 2, 1963, fr.); Taplethok–Helok, 1300–1500 m (Nov. 6, 1963, fr.); Helok–Iladanda, 1500–1800 m (Nov. 8 & 13 1963, fr.); Baroya Khimty, 2500 m (Nov. 11, 1963, fr.); Ghatte–Khebang, 1600–1700 m (Nov. 19, 1963, fl.); below Siling Tzokupa–Khebang, 2100–1700 m (Nov. 22, 1963, fr.); Bharomdin–Tharpu, 1000–1200 m (Nov. 25, 1963, fr.).

Distr. Himalaya, India, Ceylon, Burma, Thai, Indo-China, China, Formosa, Ryukyu, S. Japan, Malaysia, and Australia.

As far as the specimens I have examined are concerned, though the Japanese plants are very similar to the Himalayan ones in its outer morphology, they differ in the size and shape of petals (Fig. 19, A & B). Further studies are needed based on ample materials.

Desmodium nepalense Ohashi in Journ. Jap. Bot. **40**: 363 (1965).

Taplejung–Garhi Danra, 1900–2200 m (Nov. 3, 1963, fr.); Garhi Danra–Tuwa, 1800–2200 m (Nov. 4, 1963, fr.—Typus in TI.).

Distr. E. Himalaya (E. Nepal).

Desmodium oxyphyllum DC. in Ann. Sci. Nat. ser. 1, **4**: 102 (Jan. 1825); Prodr. **2**: 336 (Nov. 1825)–G. Don, Gen. Hist. **2**: 297 (1832)–Prain, l.c. 392 (1897)–Matsumura in Bot. Mag. Tokyo **16**: 77 (1902), p.p.–Isely in Brittonia **7**: 214 (1950)–Ohashi in Journ. Jap. Bot. **41**: 154 (1966).

Hedysarum racemosum (non Aublet 1775) Thunberg, Fl. Jap. 285 (1784).

D. racemosum (Thunb.) DC., Prodr. **2**: 337 (Nov. 1825)–Schindl. in Fedde, Rep. **22**: 259 (1926)–Nakai in Bot. Mag. Tokyo **44**: 30 (1930)–Ohwi, Fl. Jap. 683 (1953), p.p.–Liu et Chuang, l.c. 90 (1962)–van Meeuwen, l.c. 257 (1962), p.p.

H. oxyphyllum (DC.) Sprengel, Syst. Veg. **4** (2): 292 (1827).

D. podocarpum (non DC. 1825) Baker in Fl. Brit. Ind. **2**: 165 (1876), p.p.

Godavari, 1500 m (Sep. 18, 1963, fl. & fr.); Pouwa, Kathmandu, 1600 m (Oct. 9, 1963, fr.).

Distr. Himalaya, Khasia, Burma, Thai, Indo-China, Malaysia, China, Formosa, Ryukyu, Korea, and Japan.

var. **mandshuricum** (Maxim.) Ohashi in Journ. Jap. Bot. **41**: 155 (1966).

D. podocarpum var. *mandshuricum* Maximowicz in Mél. Biol. **12**: 440 (1886); in Bull. Acad. St.-Pétersb. **31**: 30 (1887).

D. podocarpum var. *membranaceum* Matsumura, l.c. 76 (1902).

D. mandshuricum (Maxim.) Schindler in Fedde, Rep. **21**: 3 (1925).

D. fallax var. *mandshuricum* (Maxim.) Nakai, l.c. 32 (1930).

D. racemosum var. *mandshuricum* (Maxim.) Ohwi, Fl. Jap. 683 et in Bull. Sci. Mus. Tokyo no. 33, 77 (1953).

Taplejung, 1700 m (Nov. 2, 1963, fr.); Taplethok-Helok, 1300-1500 m (Nov. 6, 1963).

Distr. var. Himalaya, N. China, Manchuria, Korea, Ussuri, and Japan.

D. oxyphyllum which is common in Japan from lowlands to mountain regions is very variable, but var. *mandshuricum* is apparently separable from the typical *D. oxyphyllum* s. str., i.e. var. *oxyphyllum*, in both its morphological and ecological natures (cf. Ohashi, 1966). In the specimens from Himalaya as well as from Korea, Manchuria, and China both varieties are also clearly recognizable. The most significant feature of var. *mandshuricum* is in having spreading and closely clustered leaves near the base of stem.

In Japan, furthermore, var. *oxyphyllum* seems to include two different ecological races. One is rather slender and glabrous plants bearing membranous leaves and whitish flowers, and grows usually on rather shady humid places of thicket-margins. Another is rather robust and pubescent ones having somewhat coriaceous leaves and pinkish flowers, and occurs always in sunny dry areas of roadsides, grasslands, hill-sides, etc. Our specimens from Himalaya cited above under *D. oxyphyllum* are similar to the former race.

Desmodium podocarpum DC. in Ann. Sci. Nat. ser. 1, **4**: 102 (1825)-Fl. Brit. Ind. **2**: 165 (1876), p.p.-Prain, l.c. 391 (1897)-Nakai, l.c. 34 (1930), incl. var. *indicum* Maxim. et var. *glabrius* Nakai-Isely, l.c. 208 (1950).

Dhankuta, 1200 m (Oct. 18, 1963; Oct. 19, 1963, fr.; Oct. 20, 1963, fl. & fr.).

Distr. Himalaya, India, China, Formosa, Ryukyu, Manchuria, Korea, and Japan.

According to Schindler (in Fedde, Rep. Beih. **49**: 141, 1928), *D. podocarpum* cited by Baker in Fl. Brit. Ind. **2**: 165 is a mixture of the following four species, i.e., *D. podocarpum*, *D. racemosum* (=*D. oxyphyllum*), *D. laxum*, and *D. fallax*.

Compared with the Himalayan plants, the Japanese ones differ in the length of calyx-lobes and the shape of petals (Fig. 19, C & D). In Japan and its neighbouring areas, *D. podocarpum* and its related species are particularly polymorphic and require further investigations based on ample materials.

Desmodium renifolium (L.) Schindler in Fedde, Rep. **22**: 262 (1926)-Liu et Chuang, l.c. 91 (1962)-van Meeuwen, l.c. 257 (1962).

Hedysarum renifolium L., Syst. Nat. ed. 10, **2**: 1169 (1759).

H. reniforme L., Sp. Pl. ed. 2, 1051 (1763).

D. reniforme (L.) DC., Prodr. **2**: 327 (1825)-Fl. Brit. Ind. **2**: 173 (1876).

Dhankuta, 1200 m (Oct. 21, 1963, fr.).

Distr. E. Himalaya (Nepal, Sikkim), India, Burma, Thai, Indo-China, S. China (Yunnan, Kweichow), Formosa, Malaysia, and tropical Australia.

Desmodium retusum (D. Don) Sweet, Hort. Brit. 479 (1827).

Hedysarum retusum D. Don, Prodr. Fl. Nepal. 243 (Feb. 1825).

D. concinnum DC., Prodr. **2**: 335 (Nov. 1825)–Fl. Brit. Ind. **2**: 170 (1876).

H. concinnum (DC.) Sprengel, Syst. Veg. **4** (2): 292 (1827).

Pouwa, Kathmandu, 1600 m (Oct. 9, 1963, fr.); Taplejung, 1700 m (Nov. 2, 1963, fr.); Taplejung–Garhi Danra, 2000–2200 m (Nov. 3, 1963, fr.); Garhi Danra–Tuwa, 2200–1800 m (Nov. 4, 1963, fr.); Tuwa–Taplethok, 1800–1300 m (Nov. 5, 1963, fr.); Taplethok–Helok, 1300–1500 m (Nov. 6, 1963, fr.); Iladanda–Helok, 1800–1500 m (Nov. 13, 1963, fr.); Khebang–Bharomdin, 1700–1000 m (Nov. 24, 1963, fr.); Bharomdin–Tharpu, 1000–1200 m (Nov. 25, 1963, fr.).

Distr. Himalaya (N. Punjab to N. Assam), India, Indo-China, and Malaysia.

Desmodium sequax Wallich, Pl. Asia. Rar. **2**: 46, t. 157 (1831)–Fl. Brit. Ind. **2**: 170 (1876)–Kurz in Journ. Asia. Soc. Beng. **45** (2): 227 et 232 (1877)–Prain, l.c. 400 (1897)–Merr. in Contr. Arn. Arb. **8**: 76 (1928)–van Meeuwen, l.c. 100 (1961) et 259 (1962).

Desmodium strangulatum Wight et Arnott var. *sinuatum* Miquel, Fl. Ind. Bat. **1** (1): 255 (1855).

D. sinuatum (Miq.) Blume ex Baker in Fl. Brit. Ind. **2**: 166 (1876)–Prain, l.c. 394 (1897).

D. sequax var. *sinuatum* (Bl.) Hosokawa in Journ. Soc. Trop. Agric. **4**: 313 (1932).

Godavari, Kathmandu, 1500 m (Sep. 18, 1963, fl. & fr.); Kakani, 2100–2200 m (Sep. 24, 1963, fr.); Taplejung–Garhi Danra, 2000–2200 m (Nov. 3, 1963, fr.); Garhi Danra–Tuwa, 2200–1800 m (Nov. 4, 1963, fr.); Tuwa–Taplethok, 1800–1300 m (Nov. 5, 1963, fr.); Taplethok–Helok, 1300–1500 m (Nov. 6, 1963, fr.).

Distr. Himalaya (Simla to Sikkim), Khasia, Assam, Mishmi, W. China (Yunnan, Szechuan, Kweichow, Sikang, Hupeh), Formosa, and Malaysia.

Among our specimens cited above two forms of this species were found. One has rhombic terminal leaflets with obtuse apex and is referrable to *D. sinuatum*. Another has elliptic-oblong terminal ones acute at the apex and belongs to typical *D. sequax*. In the specimens from Formosa preserved in our Herbarium, however, only the former form was collected. As compared with the Himalayan specimens of the form *D. sequax*, the form *D. sinuatum* of Formosa has larger flowers especially in its wing-petals (Fig. 19, G & H). It seems doubtful, however, whether these two forms belong to different taxa, and further studies seem to be needed based on ample materials.

Desmodium tiliaefolium (D. Don) Wallich [Cat. no. 5707 (1831–32), nom. nud.] ex G. Don, Gen. Hist. **2**: 297 (1832)–Fl. Brit. Ind. **2**: 168 (1876), excl. syn. cit. *D. nutans*–Prain, l.c. 397 (1897)–Schindl. in Fedde, Rep. **22**: 264 (1926).

Hedysarum tiliaefolium D. Don, Prodr. Fl. Nepal. 244 (1825).

Helok–Baroya Khimty, 1500–2500 m (Nov. 15, 1963, fr.).

Distr. Himalaya (N. Punjab to Tavoy), Burma, China (Yunnan, Szechuan).

Desmodium triflorum (L.) DC., Prodr. **2**: 334 (1825), excl. syn. cit. *D. biflorum* DC.–Fl. Brit. Ind. **2**: 173 (1876)–Liu et Chuang, l.c. 96 (1962)–van Meeuwen, l.c. 261 (1962).

Hedysarum triflorum L., Sp. Pl. ed. 1, 749 (1753), excl. var. β et γ.

Chobar Gorge, south of Kathmandu, 1200 m (Sep. 21, 1963, fl. & fr.); Biratnagar, 200 m (Oct. 14 & 15, 1963, fl. & fr.); Phusri-Dahara Pani, 450-900 m (Oct. 16, 1963, fl. & fr.); Bharomdin-Tharpu, 1000-1200 m (Nov. 25, 1963, fr.).

Distr. Pantropic.

Desmodium velutinum (Willd.) DC., Prodr. **2**: 328 (1825)-Schindler in Fedde, Rep. **21**: 6 (1925), incl. varr. *Roxburghii* et *Plukenetii* (Wight et Arn.) Schindler-Merr. et Perry in Journ. Arn. Arb. **29**: 156 (1948)-van Meeuwen, l.c. 264 (1962).

Hedysarum velutinum Willdenow, Sp. Pl. **3**: 1174 (1803).

H. lasiocarpum Beauvois, Fl. Oware Benin. **1**: 32 (1804).

H. latifolium Roxburgh [Hort. Beng. 57 (1814), nom. nud.] ex Kerr in Bot. Reg. **5**: t. 355 (1819).

D. lasiocarpum (Beauv.) DC., Prodr. **2**: 328 (1825)-Merr. in Philip. Journ. Sci. **5**: 88 (1910)-Liu et Chuang, l.c. 83 (1962).

D. latifolium (Roxb. ex Kerr) DC., Prodr. **2**: 328 (1825)-Fl. Brit. Ind. **2**: 168 (1876).

D. virgatum Zollinger [in Nat. Geneesk. Ark. Neêrl. Ind. **3**: 58 et 76 (1846), nom. nud.] ex King in Journ. Asia. Soc. Beng. **66** (2): 143 (1897)-Prain, l.c. 399 (1897)-Merr. in Philip. Journ. Sci. **14**: 243 (1919).

Naraka Tak-Gumane (Oct. 17, 1963, young fr.); Dhara Pani-Illam, 1500-1200 m (Dec. 5, 1963, fr.); Ranga Pani-Ghorwa, 700-300 m (Dec. 9, 1963, fr.).

Distr. Himalaya, Assam, Ceylon, Burma, Thai, Indo-China, China (Yunnan, Hainan, Kwangsi, Kwangtung), Formosa, Malaysia, and tropical Africa.

A specimen collected at near Chisa Pani, though cited here under *D. velutinum*, is somewhat different in gross morphological characters from the typical form in having petioles, axis of racemes, and loments which are densely clothed with appressed, grey pubescent, slightly larger joints, and short axillary inflorescences. The closely allied species, *D. sikkimense* Schindler occuring in Sikkim and Nepal, is characterized by having legumens covered with strigose hairs. Judging from the original description, other characters of *D. sikkimense* fall apparently within a range of variability of *D. velutinum*. The former, therefore, may better be treated as a variety of the latter¹⁾.

Dolichos falcatus Klein in Willdenow, Sp. Pl. **3**: 1047 (1803)-Fl. Brit. Ind. **2**: 211 (1876)-Merr., l.c. 135 (1910)-Meikle in Kew Bull. **1950**: 353 (1951).

Dhara Pani-Dhankuta, 900-1200 m (Oct. 17, 1963, fr.); Ranga Pani-Ghorwa, 700-300 m (Dec. 9, 1963, fr.).

Distr. Africa, Himalaya (Kumaon to Bhutan), India, Ceylon, Burma, Thai, Indo-China, and Malaysia.

Dolichos Lablab L., Sp. Pl. ed. 1, 725 (1753)-Fl. Brit. Ind. **2**: 209 (1876)-Merr., l.c. 135 (1910).

Bharomdin-Tharpu, 1000-1200 m (Nov. 25, 1963, fr.).

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1) *Desmodium velutinum* (Willd.) DC. var. **sikkimense** (Schindl.) Ohashi, stat. nov.

D. sikkimense Schindler in Fedde, Rep. **21**: 6 (1925).

Distr. Pantropic in cultivation, but a native of tropical Asia.

Dumasia villosa DC. in Ann. Sci. Nat. ser. 1, **4**: 257, t. 44 et Prodr. **2**: 241 (1825)–Fl. Brit. Ind. **2**: 183 (1876)–Merr. in Philip. Journ. Sci. **5**: 110 (1910).

Tista, 350 m (Jun. 19, 1960, old fr.); below Siling Tzokupa–Khebang, 2100–1700 m (Nov. 22, 1963, fr.).

Distr. Madagascar, Himalaya (Simla to Bhutan), India, Ceylon, Burma, Thai, Indo-China, W. & C. China, Malaysia, and tropical America.

Dunbaria rotundifolia (Lour.) Merrill in Philip. Journ. Sci. **15**: 242 (1919).

Indigofera rotundifolia Loureiro, Fl. Cochinch. 458 (1790).

D. conspersa Bentham in Miquel, Pl. Jungh. 242 (1852)–Fl. Brit. Ind. **2**: 218 (1876).

Dhara Pani–Tamur Bridge, 900–300 m (Oct. 17, 1963, fr.); Dhankuta, 1200 m (Oct. 19, 1963, fr.); Mul Pokhari–Dumhan, 2400–700 m (Oct. 30, 1963, fr.); Dumhan–Taplejung, 700–2000 m (Nov. 1, 1963, fr.); Illam–Ranga Pani, 1200–700 m (Dec. 8, 1963, fr.).

Distr. E. Himalaya, India, Burma, Thai, Indo-China, Malaysia, and tropical Australia.

Entada phaseoloides (L.) Merrill in Philip. Journ. Sci. **9**: 86 (1914)–Brenan in Kew Bull. **1955**: 164 (1955).

Lens phaseoloides L. in Stickman Herb. Amboin. 18 (1754); Amoen. Acad. **4**: 128 (1759).

E. scandens Bentham in Hook., Journ. Bot. **4**: 332 (1842)–Fl. Brit. Ind. **2**: 287 (1878).

Tuwa–Taplethok, 1800–1300 m (Nov. 5, 1963, fr.).

Distr. Pantropic.

According to Brenan, this species is an aggregate and divided into four different entities, i.e., A (=*E. phaseoloides* Merr. s. str.), B. (*E. pursaetha* DC.), C (no name available), and D (=*E. spiralis* Ridley). Unfortunately our collections which may be referred to his B or C are of poor quality. In this enumeration, therefore, *E. phaseoloides* (L.) Merr. s. lat. is adopted. In Japan this species is found in evergreen forests near seaside of Isl. Yakushima, S. Kyushu, and intermediate forms between *E. phaseoloides* s. str. and Brenan's entity B or C are often found.

Eriosema himalaicum Ohashi in Journ. Jap. Bot. **41**: 96 (1966).

Crotalaria tuberosa Hamilton ex D. Don, Prodr. Fl. Nepal. 241 (1825).

E. chinense (non Vogel 1843) Baker in Fl. Brit. Ind. **2**: 219 (1876), p.p.

E. tuberosum (Hamilt. ex D. Don) Wang et Tang, Ill. Princ. Pl. China, Legum. 701 (1955); non A. Richter (1847).

Above Lelep, 2600 m (Nov. 9, 1963, fr.); Iladanda–Helok, 1800–1500 m (Nov. 13, 1963, fr.).

Distr. E. Himalaya (Nepal to Bhutan), N. Assam, Khasia, and W. China (Yunnan).

Erythrina arborescens Roxburgh [Hort. Beng. 53 (1814), nom. nud.] Fl. Ind. ed. 2, **3**: 256 (1832)–Fl. Brit. Ind. **2**: 190 (1876)–Krukoff in Journ. Arn. Arb. **20**: 230 (1939).

Darjeeling, 2150 m (Sep. 22, 1964, fl.).

Distr. Himalaya (Kumaon to Sikkim), Khasia, Burma, and Thai.

Erythrina variegata L. in Stickm. Herb. Amboin. 10 (1754).

E. corallodendron L. var. *orientalis* L., Sp. Pl. ed. 1, 706 (1753).

E. indica Lamarck, Encycl. Méth. **2**: 391 (1785)–Fl. Brit. Ind. **2**: 188 (1876).

E. orientalis (L.) Murray in Comm. Gotting. **8**: 35, t. 1 (1787).

E. variegata var. *orientalis* (L.) Merrill, Interpr. Herb. Amboin. 276 (1917); in Philip. Journ. Sci. **5**: 11 (1910)–Krukoff, l.c. 228 (1939)–Maheshwari in Bull. Bot. Surv. Ind. **3**: 46 (1962).

Yoksam, 1800 m (May 17, 1960, no. 609); below Sombari, 1000 m (Mar. 27, 1963, fl. white); Taplejung, 1700 m (Nov. 2, 1963, fr.).

Distr. Himalaya, India, Ceylon, Burma, Thai, Malaysia, Indo-China, W. & S. China (Yunnan, Kweichow, Kwangsi, Hainan), and Australia.

A specimen collected at below Sombari is referable to f. *alba* (Blatt. et Mill.) Maheshwari, l.c. 48 (1962).

Glycine Max (L.) Merrill, Interpr. Herb. Amboin. 247 (1917)–Hermann, U.S. Dept. Agric. Tech. Bull. no. 1268, 39 (1962).

Phaseolus Max L., Sp. Pl. ed. 1, 725 (1753).

Dolichos Soja L., Sp. Pl. ed. 1, 727 (1753).

Soja hispida Moench, Meth. 153 (1794).

G. hispida (Moench) Maximowicz in Bull. Acad. Sci. St.-Pétersb. **18**: 398 (1873)–Franch. et Sav., Enum. Pl. Jap. **1**: 108 (1875).

G. Soja (non Sieb. et Zucc. 1845) Baker in Fl. Brit. Ind. **2**: 184 (1876), p.p.

Soja Max (L.) Piper in Journ. Amer. Soc. Agron. **6**: 84 (1914).

Tharpu–near Chyangthaphu, 1200–1100 m, cult. (Nov. 26, 1963, fr.).

Distr. Widely cultivated and extremely variable but not known in the wild state. It is believed to be a cultigen derived from *Glycine Soja* Sieb. et Zucc. of Eastern Asia.

Indigofera atropurpurea Hamilton ex Hornemann, Hort. Reg. Bot. Hafn. Suppl. 152 (1819)–Roxb., Fl. Ind. ed. 2, **3**: 381 (1832)–Fl. Brit. Ind. **2**: 101 (1876)–Ali in Bot. Notiser **111**: 573 (1958).

Dhankuta, 1200 m (Oct. 21, 1963, fr.).

Distr. Himalaya (Kashmir to N. Assam), India, Burma, and China (Yunnan, Kweichow, Kwangtung).

Indigofera linifolia (L. f.) Retzius, Obs. Bot. **4**: 29 (1786) et **6**: 33, t. 2 (1791)–Fl. Brit. Ind. **2**: 92 (1876)–Gillett in Kew Bull. Add. Ser. **1**: 35 (1958)–Ali, l.c. 546 (1958).

Hedysarum linifolium L. f., Suppl. Pl. 331 (1781).

Dhara Pani–Dhankuta, 900–1200 m (Oct. 17, 1963, fl. & fr.).

Distr. Tropical Africa, Afghanistan, Himalaya, India, Ceylon, Burma, Thai, Indo-China, China (Yunnan, Sikang, Szechuan, Kweichow), Malaysia, and tropical Australia.

Indigofera pulchella Roxburgh [Hort. Beng. 57 (1814), nom. nud.] Fl. Ind. ed. 2, **3**: 382 (1832)–Fl. Brit. Ind. **2**: 101 (1876).

Kakani Hill, 2200 m (Sep. 24, 1963, fr.); Taplejung–Garhi Danra, 2000–2200 m (Nov. 3, 1963, fr.); Garhi Danra–Tuwa, 2200–1800 m (Nov. 4, 1963, fr.); Taplethok–Helok, 1300–1500 m (Nov. 6, 1963, fr.); Helok–Iladanda, 1500–1800 m (Nov. 8, 1963, fr.); Iladanda–Selap, 1800–2600 m (Nov. 9, 1963, fr.); Baroya Khimty–Thakma Khola, 2500–3100 m (Nov. 12, 1963, fr.); Batasay–Bhuspate Danra, 2400–2900 m (Dec. 1, 1963, fr.).

Distr. Himalaya, and India.

Indigofera stachyodes Lindley in Bot. Reg. **1843**: 14, t. 14 (1843).

I. Dosua Hamilton ex D. Don var. *tomentosa* Baker in Fl. Brit. Ind. **2**: 102 (1876).

Pamianchi–Tingling Bridge, 2000–1000 m (May 15, 1960, no. 257, bud); Happy Valley, Darjeeling, 1900 m, cult. (Jun. 26, 1960); Phusri–Dhara Pani, 450–900 m (Oct. 16, 1963, fr.); Dumhan, 800 m (Oct. 31, 1963, fr.); Dhara Pani–Illam, 1500–1200m (Dec. 5, 1963, fr.).

Distr. E. Himalaya (Nepal to Bhutan), Khasia, Burma, Thai, and W. China (Yunnan, Kwichow).

Indigofera trifoliata L., Cent. Pl. **2**: 29 (1756); Amoen. Acad. **4**: 327 (1759); Sp. Pl. ed. 2, 1062 (1763)–Fl. Brit. Ind. **2**: 96 (1876)–Ali, l.c. 552 (1958).

Dhankuta, 1200 m (Oct. 21, 1963, fr.).

Distr. Himalaya (Kashmir to Bhutan), Assam, Khasia, Ceylon, Burma, Thai, Indo-China, S. & C. China, Formosa, Ryukyu, Malaysia, and N. Australia.

Lathyrus Aphaca L., Sp. Pl. ed. 1, 729 (1753)–Fl. Brit. Ind. **2**: 176 (1876).

Rangali–Biratnagar, 200 m (Dec. 15, 1963, fl.).

Distr. Europe, N. Africa, and S. E. Asia.

In the Himalayan Mountains the occurrence of this species has been recorded only from the western part, so our collection cited above is a new record from Eastern Himalaya.

Lathyrus sativus L., Sp. Pl. ed. 1, 730 (1753)–Fl. Brit. Ind. **2**: 179 (1876).

Rangali–Biratnagar, 200 m (Dec. 15, 1963, fl.).

Distr. Europe, N. Africa, and S. E. Asia.

Melilotus albus Medikus [Vorles. Churpf. Phys, Ges. **2**: 382 (1787), nom. nud.] ex Desrousseaux in Lamarck, Encycl. Méth. **4**: 63 (1796)–Fl. Brit. Ind. **2**: 89 (1876)–Mansfeld in Fedde, Rep. **49**: 45 (1940).

Rangali–Biratnagar, 200 m (Dec. 15, 1963, fl.).

Distr. Europe, Himalaya, N. Asia, and Siberia.

Mezoneurum cucullatum (Roxb.) Wight et Arnott, Prodr. 283 (1834)–Fl. Brit. Ind. **2**: 258 (1878).

Caesalpinia cucullata Roxburgh [Hort. Beng. 32 (1814), nom. nud.] Fl. Ind. ed. 2, **2**: 358 (1832).

Ranga Pani–Ghorwa, 700–300 m (Dec. 9, 1963, fl.); Kathgara–Rangali, 200 m (Dec. 14, 1963, fl. & young fr.); Rangali–Biratnagar, 200 m (Dec. 15, 1963, fl.).

var. **grandis** Baker in Fl. Brit. Ind. **2**: 258 (1878).

Helok–Iladanda, 1500–1800 m (Nov. 8, 1963, fr.); Penlong La, Gangtok, 2100 m (Sep. 13, 1964, fl.).

Distr. sp. E. Himalaya (Nepal to N. Assam), India, Burma, Thai, Indo-China, W. China (Yunnan), and Malaysia.

Millettia auriculata Baker ex Brandis, For. Fl. Ind. 138 (1874)–Fl. Brit. Ind. **2**: 108 (1876)–Brandis, Ind. Tr. 220 (1906).

Ranga Pani–Ghorwa (Dec. 9, 1963, fr.); Ghorwa–Sanichare, 200m (Dec. 10, 1963, fr.).

Distr. Himalaya (Kumaon to Sikkim), India, and Indo-China.

Millettia cinerea Bentham in Miquel, Pl. Jungh. 249 (1852)-Fl. Brit. Ind. **2**: 106 (1876).

Pamianchi-Tingling Bridge, 2000-1000 m (May 15, 1960, bud).

Distr. E. Himalaya (Sikkim to N. Assam), N. Burma, and W. China (Yunnan).

Mimosa pudica L., Sp. Pl. ed. 1, 518 (1753)-Fl. Brit. Ind. **2**: 291 (1879)-Brenan in Kew Bull. **1955**: 184 (1955).

Biratnagar, 200 m (Oct. 14 & 15, 1963, fr.); Phusri-Dhara Pani (Oct. 16, 1963, fr.); Bharomdin-Tharpu, 1000-1200 m (Nov. 25, 1963, fr.); Ranga Pani-Ghorwa, 700-300 m (Dec. 9, 1963, fr.).

Distr. A native of tropical America, but now pantropic.

Mimosa rubicaulis Lamarck, Encycl. Méth. **1**: 20 (1783)-Fl. Brit. Ind. **2**: 291 (1878).

Phusri-Dhara Pani, 450-900 m (Oct. 16, 1963, fl.); Dhara Pani-Dhankuta, 900-1200 m (Oct. 17, 1963, fl.); Garhi Danra-Tuwa, 2200-1800 m (Nov. 4, 1963, fr.); Ranga Pani-Ghorwa, 700-300 m (Dec. 9, 1963, fl.).

Distr. Himalaya (Kumaon to Bhutan) and India.

Moghania macrophylla (Willd.) O. Kuntze, Rev. Gen. Pl. **1**: 199 (1891)-Hui-Lin Li in Amer. Journ. Bot. **31**: 226 (1944)-Nooteboom in Reinwardtia **5**: 434 (1961).

Crotalaria macrophylla Willdenow, Sp. Pl. **3**: 982 (1803).

Flemingia congesta Roxburgh ex Aiton, Hort. Kew. ed. 2, **4**: 349 (1812)-Fl. Brit. Ind. **2**: 228 (1876)-Prain in Journ. Asia. Soc. Beng. **66** (2): 349 (1897).

Taplethok-Helok, 1300-1500 m (Nov. 6, 1963, fl. & fr.); Ghatte-Khebang, 1600-1700 m (Nov. 19, 1963, fr.); Khebang-Bharomdin, 1700-1000 m (Nov. 24, 1963, fr.); Tharpu-near Chyangthaphu, 1200-1100 m (Nov. 26, 1963, fl. & fr.); Birwa-below Yektin, 2400-1400 m (Nov. 28, 1963, fl. & fr.); Rangali-Biratnagar, 200 m (Dec. 15, 1963, fr.).

Distr. Himalaya, India, Ceylon, Burma, Thai, Indo-China, China, Formosa, Ryukyu, Malaysia, tropical Australia, and tropical Africa.

Moghania strobilifera (L.) J. St.-Hilaire ex Jackson in Index Kew. **3**: 252 (1894)-Hui-Lin Li, l.c. 227 (1944)-Nooteboom, l.c. 433 (1961), p.p.

Hedysarum strobiliferum L., Sp. Pl. ed. 1, 746 (1755).

Flemingia strobilifera (L.) R. Brown ex Aiton, Hort. Kew. ed. 2, **4**: 350 (1812)-Fl. Brit. Ind. **2**: 227 (1876)-Prain, l.c. 437 (1897).

Ranga Pani-Ghorwa, 700-300 m (Dec. 9, 1963, fr.).

var. **bracteata** (Roxb.) Ohashi, comb. nov.

Hedysarum bracteatum Roxburgh, Fl. Ind. ed. 2, **3**: 351 (1832).

Flemingia bracteata (Roxb.) Wight, Icon. **1**: t. 268 (1840)-Prain, l.c. 437 (1897)-Craib in Kew Bull. **1911**: 42 (1911).

F. strobilifera var. *bracteata* (Roxb.) Baker in Fl. Brit. Ind. **2**: 227 (1876).

Moghania bracteata (Roxb.) Hui-Lin Li in Amer. Journ. Bot. **31**: 225 (1944).

Kakani Hill, 2200 m (Sep. 24, 1963, fl. & fr.); Dhankuta, 1200 m (Oct. 19 & 21, 1963, fr.).

Distr. sp. Himalaya (Simla to Bhutan), India, Ceylon, Burma, Thai, Indo-China, Malaysia, W. & S. China (Yunnan, Kweichow, Kwangsi, Hainan), Formosa, and tropical America (Jamaica, Trinidad).

Mucuna nigricans (Lour.) Steudel, Nom. Bot. ed. 2, **2**: 163 (1841)–Merrill in Philip. Journ. Sci. **5**: 116 (1910).

Citta nigricans Loureiro, Fl. Cochinch. 456 (1790).

M. imbricatum DC., Prodr. **2**: 406 (1825)–Fl. Brit. Ind. **2**: 185 (1876).

Stizolobium imbricatum (DC.) O. Kuntze, Rev. Gen. Pl. **1**: 208 (1891).

Batasi, 2000 m (May 2, 1960, fl.); Gangtok, Penlong La, 2100 m (Mar. 18, 1963, fl. & Sep. 13, 1964, fr.); Tharpu–near Chyangthaphu, 1200–1100 m (Nov. 26, 1963, fr.); Ranga Pani–Ghorwa, 700–300 m (Dec. 9, 1963, fr.).

Distr. E. Himalaya (Nepal, Sikkim), India, Burma, Thai, Indo-China, Formosa, S. Ryukyu, and Malaysia.

Parochetus communis Hamilton ex D. Don, Prodr. Fl. Nepal. 240 (1825)–Fl. Brit. Ind. **2**: 86 (1876)–Hochr. in Candollea **2**: 394 (1925).

Kurseong, 1600 m (Apr. 12, 1960, fl.); Senchal, 2400 m (Apr. 16, 1960, fl.); Senchal–Takdah, 2400–1600 m (Apr. 17, 1960, fl.); Rimbick, 2200 m (May 5, 1960, fl.); Palmajua–Rimbick, 2300–2200 m (May 5, 1960, fl.); Godavari, 1600 m (Sep. 18, 1963, fl.); Dhankuta–Sinduwa, 1200 m (Oct. 22, 1963, fl. & fr.); Dhankuta–Hilay, 1200–1800 m (Oct. 23, 1963, fl.); Bilbatay Bhanjang–Hati Sar, 2200–2700 m (Oct. 27, 1963, fl.); Baroya Khimty, 2500 m (Nov. 11, 1963, fl. & fr.); Iladanda–Selap, 1800–2600 m (Nov. 9, 1963, fr.).

Distr. Himalaya (Simla to N. Assam), Nilghiris, Ceylon, Burma, Thai, and Malaysia.

Phaseolus lunatus L., Sp. Pl. ed. 1, 724 (1753)–Fl. Brit. Ind. **2**: 200 (1876)–Merrill in Philip. Journ. Sci. **5**: 354 (1910).

Bharomdin–Tharpu, 1000–1200 m (Nov. 25, 1963, fl. & fr.); Tharpu–near Chyangthaphu, 1200–1100 m (Nov. 26, 1963, fl. & fr.); near Chyangthaphu–Birwa, 1100–2400 m (Nov. 27, 1963, fl. & young fr.); below Yektin–Batasay, 1400–2400 m (Nov. 30, 1963, fl. & fr.); Dhara Pani–Illam, 1500–1200 m (Dec. 5, 1963, fr.); Illam, 1200 m (Dec. 7, 1963, fr.).

Distr. Pantropics.

Phaseolus Mungo L., Mant. Pl. 101 (1767)–Fl. Brit. Ind. **2**: 203 (1876), p.p.–Prain in Journ. Asia. Soc. Beng. **66** (2): 423 (1897)–Piper et Morse in Bull. U.S. Dep. Agr. no. 119, 26 (1914)–Kitamura in Land Crop. Himal. **2**: 122 (1956).

Phusri–Dhara Pani (Oct. 16, 1963, fl.); below Siling Tzokupa–Khebang, 2100–1700 m (Nov. 22, 1963, fr.); Tharpu–Chyangthaphu, 1200–1100 m (Nov. 26, 1963, fr.).

Distr. Himalaya, India, Ceylon, and Burma, both wild and cultivated.

Phaseolus pubescens Blume, Cat. Gew. Buitenz. 93 (1823).

Dolichos umbellatus Thunberg in Trans. Linn. Soc. **2**: 339 (1794).

P. calcaratus Roxburgh [Hort. Beng. 54 (1814), nom. nud.] Fl. Ind. ed. 2, **3**: 289 (1832)–Fl. Brit. Ind. **2**: 203 (1876)–Prain, l.c. 49 (1897)–Merr., l.c. 132 (1910)–Kitamura, l.c. 121 (1956).

P. Ricciardianus Tenore, Ind. Sem. Hort. Bot. Neapol. 14 (1833); Cat. Real. Ort. Bot. Napol. 90 (1845)–Nakai in Bot. Mag. Tokyo **42**: 473 (1928)–Hara in Misc. Rep. Res. Inst. Nat. Res. no. 10, 7 (1946)–Nakai in Bull. Sci. Mus. Tokyo no. 27, 47 (1949).

Azukia umbellata (Thunb.) Ohwi, Fl. Jap. 691 et in Bull. Sci. Mus. Tokyo no. 33, 77 (1953).

Phusri, 450 m, cult. (Oct. 16, 1963, fl.); Sanguri Bhanjang, 1200 m, cult. (Oct. 16, 1963, fl. & fr.); below Siling Tzokupa-Khebang, 2100–1700 m, cult. (Nov. 22, 1963, fr.); Illam-Ranga Pani, 1200–700 m, cult. (Dec. 8, 1963, fr.).

Distr. Cultivated in Himalaya, India, Ceylon, Burma, Thai, Malaysia, China, Korea, Formosa, Ryukyu, and Japan, but a native of SE. Asia.

A *Phaseolus* species called " Kanime " or " Tsuru-azuki " in Japanese is an important crop in Asia, especially in India, Burma, China, Korea, and Japan. In Japan, " Kanime " has been regarded as conspecific with Indian *P. pubescens* or as an independent cultigen, *P. Ricciardianus*. Our specimens from East Nepal, though they are also highly variable and particularly polymorphic as in " Kanime ", seem to be referrable to *P. pubescens* and were collected at four localities as cited above. As compared with " Kanime ", one of the specimens collected at a field between Illam and Ranga Pani has larger seeds (8–11 mm long, 3–5 mm wide) with longer hilum (4–6 mm long) and more dense, spreading, longer hairs (2–3 mm long) on stems, while other three of the specimens resemble a Japanese cultivated form, f. *pallidus*[1] which is characterized by having pale yellowish or greenish brown seeds. Although further critical studies based on ample materials are much needed, I prefer at present to consider that " Kanime " is conspecific with *P. pubescens* because the characters of the two overlap widely.

Phyllodium pulchellum (L.) Desvaux in Mém. Soc. Linn. Paris **4**: 324 (1826)–Benth. in Miq., Pl. Jungh. 217 (1852)–Schindl. in Fedde, Rep. Beih. **49**: 360 (1928).

Hedysarum pulchellum L., Sp. Pl. ed. 1, 747 (1753).

Dicerma pulchellum (L.) DC. in Ann. Sci. Nat. ser. 1, **4**: 236 (1825).

Desmodium pulchellum (L.) Bentham, Fl. Hongk. 83 (1861)–Fl. Brit. Ind. **2**: 162 (1876)–Merrill in Philip. Journ. Sci. **5**: 79 (1910)–Liu et Chuang in Taiwania no. **8**: 89 (1962)–van Meeuwen in Reinwardtia **6**: 256 (1962).

Ranga Pani–Ghorwa, 700–300 m (Dec. 9, 1963, fr.); Ghorwa–Sanichare, 300–200 m (Dec. 10, 1963, fr.).

Distr. E. Himalaya, India, Ceylon, Burma, Thai, Indo-China, Malaysia, W. & S. China, Formosa, Ryukyu, and tropical Australia.

Piptanthus nepalensis (Hooker) D. Don in Sweet, Brit. Fl. Gard. **3**: t. 264 (1828)–Fl. Brit. Ind. **2**: 62 (1876)–Prain in Journ. Asia. Soc. Beng. **66** (2): 348 (1897).

Baptisia nepalensis Hooker, Exot. Fl. t. 131 (1825).

Ramam, 2500 m (May 8, 1960, fl. & fr.); Hati Sar–Minchin Dhap, 2600–2800 m (Oct. 28, 1963, fr.); Minchin Dhap–Mul Pokhari, 2800–2400 m (Oct. 29, 1963, fr.); below Siling Tzokupa–Siling Tzokupa, 2100–3800 m (Nov. 21, 1963, fr.); Bhuspate Danra–below Mai Majuwa, 2900–1600 m (Dec. 3, 1963, fr.); Dhara Pani–Illam, 1500–1200 m (Dec. 5, 1963, fr.).

Distr. Himalaya (Simla to Bhutan), Khasia, Assam, Jaintea Hills, and Burma.

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1) **Phaseolus pubescens** Blume f. **pallidus** (Nakai) Ohashi, comb. nov.

P. Ricciardianus var. *pallidus* Nakai in Bot. Mag. Tokyo **42**: 473 (1928), ut *pallida*; in Bull. Sci. Mus. Tokyo no. 27, 47 (1949).

P. Ricciardianus f. *pallidus* (Nakai) Hara in Misc. Rep. Res. Inst. Nat. Res. no. 10, 8 (1946).

Pisum sativum L., Sp. Pl. ed. 1, 727 (1753)–Fl. Brit. Ind. **2**: 181 (1876)–Merrill in Philip. Journ. Sci. **5**: 108 (1910).

Ghatte–Khebang, 1600–1700 m, cult. (Nov. 19, 1963, fl.); near Chyangthaphu–Birwa, 1100–2400 m, cult. (Nov. 27, 1963, fr.).

Distr. Widely cultivated, and derived from *P. sativum* var. *arvense* (L.) Poiret (=*P. arvense* L.) occuring in the Mediterranean region.

Priotropis cytisoides (Roxb.) Wight et Arnott, Prodr. 180 (1834)–Fl. Brit. Ind. **2**: 65 (1876).

Crotalaria cytisoides Roxburgh, Fl. Ind. ed. 2, **3**: 276 (1832).

Godavari, 1600 m (Sep. 18, 1963, fl. & fr.).

Distr. E. Himalaya (Nepal to Ava), Burma, and W. China (Yunnan).

Pteroloma triquetrum (L.) Bentham in Miquel, Pl. Jungh. 217 (1852)–Schindl. in Fedde, Rep. **20**: 271 (1924)–Hutchinson, Gen. Fl. Pl. **1**: 484 (1964).

Hedysarum triquetrum L., Sp. Pl. ed. 1, 746 (1753).

Desmodium triquetrum (L.) DC., Prodr. **2**: 326 (1825)–Fl. Brit. Ind. **2**: 163 (1876), p.p.–Prain in Journ. Asia. Soc. Beng. **66** (2): 390 (1897), incl. subsp. *genuinum* Prain, ut *genuina*–van Meeuwen in Reinwardtia **6**: 262 (1962).

Mul Pokhari–Dumhan, 2400–700 m (Oct. 30, 1963, fr.); Dumhan–Taplejung, 700–2000 m (Nov. 1, 1963, fr.); Illam–Ranga Pani, 1200–700 m (Dec. 8, 1963, fr.).

Distr. Himalaya (Kumaon to N. Assam), India, Ceylon, Mascarene Isl., Burma, Thai, Indo-China, S. China (Yunnan, Kwangsi, Hainan, Kwangtung, Fukien), Malaysia, and tropical Australia.

Pueraria peduncularis Graham [in Wallich, Cat. no. 5354 (1831–32), nom. nud.] ex Bentham in Journ. Linn. Soc. **9**: 124 (1867)–Fl. Brit. Ind. **2**: 197 (1876).

Minchin Dhap–Mul Pokhari, 2800–2400 m (Oct. 29, 1963, fr.); Baroya Khimty–Thakma Khola, 2500–3300 m (Nov. 16, 1963, fr.).

Distr. E. Himalaya (Nepal to Mishmi), Khasia, and W. China (Yunnan).

Pueraria Wallichii DC., Mém. Legum. t. 43 et Prodr. **2**: 240 (1825)–Fl. Brit. Ind. **2**: 198 (1876)–Prain in Journ. Asia. Soc. Beng. **66** (2): 419 (1897).

Dhankuta, 1200 m (Oct. 21, 1963, fl.); Garhi Danra–Tuwa, 2200–1800 m (Nov. 4, 1963, fl.); Taplethok–Helok, 1300–1500 m (Nov. 6, 1963, fl.); Khebang–below Siling Tzokupa, 1700–2100 m (Nov. 20, 1963, fl.); below Siling Tzokupa–Khebang, 2100–1700 m (Nov. 22, 1963, fl.); Tharpu, 1200 m (Nov. 26, 1963, fl.); Tharpu–near Chyangthaphu, 1200–1100 m (Nov. 26, 1963, fl.); Illam–Ranga Pani, 1200–700 m (Dec. 8, 1963, fl.).

Distr. E. Himalaya (Nepal to Mishmi), Khasia, Assam, Burma, Thai, and W. China (Yunnan).

Sesbania grandiflora (L.) Poiret in Lamarck, Encycl. Méth. **7**: 127 (1806), ut *Sesban grandiflorus*–Pers., Syn. **2**: 316 (1807)–Fl. Brit. Ind. **2**: 115 (1876)–Merr. in Philip. Journ. Sci. **5**: 75 (1910).

Robinia grandiflora L., Sp. Pl. ed. 1, 772 (1753).

Aeschynomene grandiflora (L.) L., Sp. Pl. ed. 2, 1060 (1763).

Biratnagar, 200 m (Oct. 14, 1963, fl.).

Distr. Himalaya, India, Ceylon, Mascarene Isl., and Malaysia, but often cultivated or naturalized.

Sesbania Sesban (L.) Merrill in Philip. Journ. Sci. **7**: 235 (1912)–Gillett in

Kew Bull. **17**: 112 (1963)–Burbidge in Austr. Journ. Bot. **13**: 124 (1965).

Aeschynomene Sesban L., Sp. Pl. ed. 1, 714 (1753).

S. aegyptiaca Poiret in Lamarck, Encycl. Méth. **7**: 128 (1806), ut *Sesban aegyptiacus*–Fl. Brit. Ind. **2**: 114 (1876)–Prain in Journ. Asia. Soc. Beng. **66** (2): 367 (1897).

Biratnagar, 200 m (Oct. 14, 1963, fr.; Dec. 18, 1963, fl. & fr.); Kathgara–Rangali, 200 m (Dec. 14, 1963, fr.); Rangali–Biratnagar, 200 m (Dec. 15, 1963, fr.).

Distr. Pantropic.

Shuteria vestita Wight et Arnott, Prodr. 207 (1834)–Fl. Brit. Ind. **2**: 181 (1876)–Merr. in Philip. Journ. Sci. **5**: 110 et 354 (1910).

Happy Valley, Darjeeling, 1900 m (Apr. 10, 1960, fr.); Lopchu, 900 m (Apr. 28, 1960, fr.); Tingling Bridge–Yoksam, 1000–1700 m (May 16, 1960, no. 312, fr.); Kakani, 2100–2200 m (Sep. 24, 1963); Minchin Dhap–Mul Pokhari, 2800–2400 m (Oct. 29, 1963); Nissim–Dumhan, 1500–700 m (Oct. 30, 1963); Taplejung–Garhi Danra, 2000–2200 m (Nov. 3, 1963, old fr.); Tuwa–Taplethok, 1800–1300 m (Nov. 5, 1963, bud); Ghatte, 1300 m (Nov. 17, 1963, fl.); Ghatte–Khebang, 1600–1700 m (Nov. 19, 1963, fl.); Khebang–below Siling Tzokupa, 1700–2100 m (Nov. 20, 1963, fl.); Chyangthapu–Birwa, 1100–2400 m (Nov. 27, 1963, fl.); below Yektin–Akasay, 1400–2300 m (Nov. 30, 1963, fl.); Dhara Pani–Illam, 1500–1200 m (Dec. 5, 1963, fl.); Illam–Ranga Pani, 1200–700 m (Dec. 8, 1963, fl.).

Distr. E. Himalaya (Nepal to Mishmi), Khasia, India, Ceylon, Burma, Thai, Malaysia, and W. China (Yunnan).

Smithia ciliata Royle, Ill. Bot. Himal. 201, t. 35, f. 2 (1839)–Fl. Brit. Ind. **2**: 150 (1876)–Merr. in Philip. Journ. Sci. **5**: 77 (1910)–Ohwi in Act. Phytotax. Geobot. **12**: 109 (1943)–Back. in Blumea **5**: 512 (1945)–van Meeuwen in Reinwardtia **5**: 444 (1961).

S. japonica Maximowicz in Mél. Biol. **9**: 57 (1873)–Ohwi, Fl. Jap. ed. rev. 796 (1965).

Sinduwa, 2100 m (Oct. 23, 1963, fl. & fr.); Mul Pokhari–Dumhan, 2400–700 m (Oct. 30, 1963, fr.).

Distr. Himalaya (Simla to Sikkim), Khasia, Bihar, N. Burma, Thai, Indo-China, Malaysia, China, Formosa, and Japan.

In sunny places of southern Japan, there occurs a *Smithia* plant which closely resembles *S. ciliata* but has generally been treated as a distinct species, *S. japonica*. According to the original description of the former species, it has yellow flowers while the latter bears whitish blue ones. According to Merrill (1910), however, the Royle's description of *S. ciliata* is incorrect and the colour of the flowers of the species is whitish blue. Having examined carefully many specimens of both species, I could not find any reliable characters to separate *S. japonica* from *S. ciliata* as was once pointed out by Ohwi (1943).

Smithia conferta J. E. Smith in Rees, Cyclop. **33**: no. 2 (1816)–Benth. in Miq., Pl. Jungh. 213 (1852).

S. geminiflora Roth, Nov. Pl. Sp. 352 (1821)–Fl. Brit. Ind. **2**: 149 (1876), incl. var. *conferta* (J. E. Smith) Baker.

Godavari, Kathmandu, 1500 m (Sep. 18, 1963, fr.).

Distr. Himalaya, India, Ceylon, Burma, Indo-China, Malaysia, S. China (Kwangtung), and tropical Australia.

Smithia sensitiva Aiton, Hort. Kew. **3**: 496 (1789)–Fl. Brit. Ind. **2**: 148 (1876)–van Meeuwen, l.c. 444 (1961).

Chobar Gorge, south of Kathmandu, 1200 m (Sep. 21, 1963, fr.); Phusri–Dhara Pani, 450–900 m (Oct. 16, 1963, fr.); Dhara Pani–Dhankuta, 900–1200 m (Oct. 17, 1963, fr.); Bharomdin–Tharpu, 1000–1200 m (Nov. 25, 1963, fr.); Sibganja–Mahara Bahara, 200 m (Dec. 12, 1963, fr.); Gauriganja–Rangali, 200 m (Dec. 13, 1963, fr.).

Distr. Tropical and subtropical Africa, Asia, and Australia.

Spatholobus parviflorus (Roxb.) O. Kuntze, Rev. Gen. Pl. **1**: 205 (1891).

Butea parviflora Roxburgh, Fl. Ind. ed. 2, **3**: 248 (1832).

S. Roxburghii Bentham in Miquel, Pl. Jungh. 238 (1852)–Fl. Brit. Ind. **2**: 193 (1876)–Prain in Journ. Asia. Soc. Beng. **66** (2): 412 (1897).

Dumhan–Taplejung, 2000 m (Oct. 31, 1963, fr.; Nov. 1, 1963, fr.); Sibganja–Mahara Bahara, 200 m (Dec. 12, 1963, fr.).

Distr. Himalaya, India, Burma, Thai, Indo-China, and China.

Stizolobium pruriens (L.) Medicus in Vorles. Churpf. Phys. Ges. **2**: 399 (1787).

Dolichos pruriens L. in Stickm. Herb. Amboin. 23 (1754).

Mucuna pruriens (L.) DC., Prodr. **2**: 405 (1825)–Fl. Brit. Ind. **2**: 187 (1876)–Prain in Journ. Asia. Soc. Beng. **66** (2): 68 (1897).

Phusri–Dhara Pani 450–900 m (Oct. 16, 1963, fl.); Dhara Pani–Dhankuta, 900–1200 m (Oct. 17, 1963); Illam–Ranga Pani, 1200-700 m (Dec. 8, 1963, fr.).

Distr. Himalaya, India, Ceylon, Burma, Thai, Indo-China, and Malaysia.

Tamarindus indica L., Sp. Pl. ed. 1, 34 (1753)–Fl. Brit. Ind. **2**: 273 (1878)–Merr. in Philip. Journ. Sci. **5**: 40 (1910).

Sibganja–Gauriganja, 200 m, cult. (Dec. 12, 1963, fr.).

Distr. Pantropic in cultivation, probably native in tropical Africa.

Tephrosia candida DC., Prodr. **2**: 249 (1825)–Fl. Brit. Ind. **2**: 111 (1876)–Wood in Rhodora **51**: 374 (1949).

Robinia candida Roxburgh [Hort. Beng. 56 (1814), nom. nud.] Fl. Ind. ed. 2, **3**: 327 (1832).

Phusri–Dhara Pani (Oct. 16, 1963, fr.); Khebang–Bharomdin, 1700–1000 m (Nov. 24, 1963, fr.); Tharpu–near Chyangthaphu, 1200–1100 m (Nov. 26, 1963, fr.); Ranga Pani–Ghorwa, 700–300 m (Dec. 9, 1963, fr.).

Distr. Himalaya (Kumaon to N. Assam), India, Burma, and Malaysia.

Uraria lagopodioides (L.) Desvaux in Mém. Soc. Linn. Paris **4**: 309 (1826)–Merrill, l.c. **5**: 93 (1910)–van Meeuwen in Reinwardtia **5**: 451 (1961).

Hedysarum lagopodioides L., Sp. Pl. ed. 1, 1198 (1753).

H. lagopoides Burman f., Fl. Ind. 168, t. 53, f. 2 (1768).

U. lagopoides DC., Prodr. **2**: 324 (1825)–Fl. Brit. Ind. **2**: 156 (1876)–Prain in Journ. Asia. Soc. Beng. **66** (2): 380 (1897).

Phusri–Dhara Pani, 450–900 m (Oct. 16, 1963, fr.); Dhankuta, 1200 m (Oct. 19, 1963, fr.).

Distr. Himalaya (N. Punjab to Bhutan), Assam, Burma, Thai, Indo-China, S. China, Formosa, Malaysia, Polynesia, and tropical Australia.

Uraria rufescens (DC.) Schindler in Fedde, Rep. **21**: 14 (1925)–van Meeuwen, l.c. 453 (1961).

Desmodium rufescens DC. in Ann. Sci. Nat. ser. 1, **4**: 101 (1825).

Doodia hamosa Roxburgh, Fl. Ind. ed. 2, **3**: 367 (1832).

U. hamosa (Roxb.) Sweet [Hort. Brit. ed. 2, 149 (1830), nom. nud.] ex Wight et Arnott, Prodr. 222 (1834)-Fl. Brit. Ind. **2**: 156 (1876).

Phusri-Dhara Pani, 450-900 m (Oct. 16, 1963, fr.); Dhankuta, 1200 m (Oct. 19, 1963, fr.).

Distr. Himalaya, India, Ceylon, Burma, Thai, Indo-China, S. China, and Malaysia.

Vicia angustifolia L., Amoen. Acad. **4**: 105 (1759).

V. sativa var. *angustifolia* (L.) Wahlenberg, Fl. Carpth. 218 (1814)-Fl. Brit. Ind. **2**: 178 (1876).

Sibganja-Mahara Bahara, 200 m (Dec. 12, 1963, fr.); Rangali-Biratnagar, 200 m (Dec. 15, 1963, fr.).

Distr. Europe, N. Africa, Asia Minor, Iran, Caucasus, Afghanistan, Himalaya, and Siberia.

Vicia hirsuta (L.) S. F. Gray, Nat. Arr. Brit. Pl. **2**: 614 (1821)-Fl. Brit. Ind. **2**: 177 (1876).

Ervum hirsutum L., Sp. Pl. ed. 1, 738 (1753).

Sibganja-Mahara Bahara, 200 m (Dec. 12, 1963, fl. & fr.); Rangali-Biratnagar, 200 m (Dec. 15, 1963, fr.).

Distr. Europe, N. Africa, Asia, and N. America.

Vigna sinensis (L.) Savi ex Hasskarl, Cat. Hort. Bogor. 279 (1844)-Endl. ex Hassk., Pl. Jav. Rar. 386 (1848)-Merr. in Philip. Journ. Sci. **5**: 133 (1910).

Dolichos sinensis L., Cent. Pl. 28 (1756); Amoen. Acad. **4**: 132 et 326 (1759).

Phaseolus cylindricus L., Amoen. Acad. **4**: 132 (1759).

D. Catjang Burman f., Fl. Ind. 161 (1768)-L., Mant. Pl. **2**: 269 (1771).

V. Catjang (Burm. f.) Walpers in Linnaea **13**: 533 (1839)-Fl. Brit. Ind. **2**: 205 (1876).

V. cylindrica (L.) Skeels in U. S. Dept. Agr. Bur. Pl. Ind. Bull. **282**: 32 (1913)-Merr., Interpr. Herb. Amboin. 284 (1918).

Garhi Danra-Tuwa, 2200-1800 m (Nov. 4, 1963, fr.).

Distr. Cultivated in tropical, subtropical and warm temperate regions and a native of tropical Asia.

Zornia gibbosa Spanoghe in Linnaea **15**: 192 (1841)-Mohlenbrock in Webbia **16**: 112 (1961)-Dandy et Milne-Redhead in Kew Bull. **17**: 74 (1963).

Z. diphylla (L.) Persoon sensu Fl. Brit. Ind. **2**: 147 (1876), p.p.-Nooteboom in Reinwardtia **5**: 453 (1961), p.p.

Phusri-Dhara Pani, 450-900 m (Oct. 16, 1963, fr.); Garhi Danra-Tuwa, 2200-1800 m (Nov. 4, 1963, fr.); Tuwa-Taplethok, 1800-1300 m (Nov. 5, 1963, fr.).

Distr. sp. Himalaya, India, Burma, Malaysia, Indo-China, China, Formosa, and Japan.

The taxonomy of the species of *Zornia* Pers. has lately been revised throughly by Mohlenbrock (1961). The taxonomic position of *Zornia diphylla* (L.) Pers., however, has long been confused and the arguments were held on many occassions (Milne-Redhead, 1954; Dandy and Milne-Redhead, 1963) till Dandy and Milne-Redhead clearly pointed out that *Z. diphylla* is a species strictly confined to Ceylon and southern India, though the plants from various other tropical regions having been referred to it.

Mohlenbrock (1961) identified the Himalayan plants, which have thus far erroneously been referred to *Z. diphylla* Pers., as *Z. gibbosa* Span. Although, according to Mohlenbrock, *Z. gibbosa* is characterized in having glabrous bracts and numerous retrorsely hairy bristles, all our specimens examined have characteristic narrow lanceolate to lanceolate leaflets, ciliate bracts, and glandular loments that are reticulate on the surface, the reticula with numerous pilose bristles attaining 1.5 mm long and the pilose sutures. As compared with the specimen collected by Merrill (No. 3787), which is one of the duplicates cited under *Z. gibbosa* by Mohlenbrock and considered to represent the typical form of this species (Pl. 21 w), the Himalayan plants here under study differ in having glabrous loment-bristles except the tip (Pl. 21 x, y), though this feature seen also in *Z. diphylla*, prominent reticulations, and ciliate bracts. As mentioned above, no specimen of our collections exactly agrees with the specimen collected by Merrill (No. 3787) and the description of *Z. gibbosa* provided by Mohlenbrock. Notwithstanding their differences in some loment characters, I tentatively here in this paper referred all these Himalayan specimens to *Z. gibbosa* sensu Mohlenbrock.

In Japan, only one species of *Zornia* is known. It was previously referred to *Z. diphylla* by many authors but recently regarded by Ohwi (1965) as identical with *Z. cantoniensis* Mohlenbrock. This plant grows in the rather sunny grasslands in *Pinus* forests at the seasides of southern Shikoku. The Japanese plants are very characteristic in having villous loments (Pl. 21, z) exserted from the bracts, a diagnostic character of *Z. cantoniensis.* However it should be noted here that all the Japanese specimens examined have reticulate nerves on the surface of the joints quite contrary to the original description of *Z. cantoniensis.*

The two species given above, i.e., *Z. gibbosa* and *Z. cantoniensis*, seem to be closely related to each other and the differences are not always clear as given by Mohlenbrock, for the variation ranges in some loment characters of each species are considerably wide and often continuous. According to the key provided by Mohlenblock (p. 14, 1961), *Z. gibbosa* and *Z. cantoniensis* can be distinguished by the size of joints and whether their loments are glabrous (*Z. gibbosa*) or puberlent to villous (*Z. cantoniensis*). It is, however, difficult to determine in the specimens whether the loments are glabrous or villous, especially in those with numerously hairy bristles. Among the specimens I have examined, the plants collected by the late Prof. B. Hayata at Chiang Mai, Thailand (Sep. 24, 1921, TI), are apparently an intermediate between these two species, in having both glabrous and villous loments on the same individuals. The size of loment-segments of these two species, though stated by Mohlenbrock to be different, shows an almost same range of variation, namely 1.5–2.5 mm long.

It is, in conclusion, proper to regard *Z. cantoniensis* as representing a race included in the variability of *Z. gibbosa.*1)

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1) **Zornia gibbosa** Spanoghe var. **cantoniensis** (Mohlenbrock) Ohashi, stat. nov.

Z. cantoniensis Mohlenbrock in Webbia **16**: 124 (1961).

Distr. Malaysia, Indo-China, S. China (Kwangsi, Hainan, Kwangtung, Fukien, Kiangsi), Formosa, and Japan (S. Shikoku).

GERANIACEAE (by Hiroshi Hara)

Geranium Lamberti Sweet, Hort. Brit. add. 492 (1827); Geraniac. **4**: t. 338 (1827).

G. Grevilleanum Wallich, Pl. Asia. Rar. **3**: 4, t. 209 (1831)–Fl. Brit. Ind. **1**: 430 (1874)–Knuth in Pfl.-reich IV–129, Ht. **53**: 185 (1912).

Bilbatay Bhanjang–Tinjuray, 2700 m (Oct. 27, 1963, fl., fr.); above Lelep, 2500 m (Nov. 9, 1963, fr.); Baroya Khimty–Thakma Khola, 2700m (Nov. 12 & 16, 1963, fr.); Siling Tzokupa, 2700 m (Nov. 21, 1963, fr.); Kaulepati Bhanjang–Khunga, 1700 m (Nov. 27, 1963, fr.).

Distr. Himalaya (Swat Himalaya to Sikkim), and S. Tibet.

Geranium nepalense Sweet, Geraniac. **1**: t. 12 (1820)–Fl. Brit. Ind. **1**: 430 (1874)–Knuth, l.c. 192 (1912).

Darjeeling, 2100 m (Apr. 2 & Jun. 21, 1960; Mar. 13, 1963, fl.); Senchal, 2400 m (Apr. 17, 1960, fl.); Garibans–Tonglu, 2800–3000 m (Jun. 7, 1960, fl.); Batasi–Palmajua, 2100–2300 m (May 3, 1960, no. 57, fl.); Godavari, Kathmandu, 1500 m (Sep. 18 & 23, 1963, fl.); Hilay–Murhay, 1800–2100 m (Oct. 23, 1963); Sinduwa, 2100 m (Oct. 24, 1963, fl.); Bilbatay Bhanjang, 2200 m (Oct. 26, 1963, fl., fr.); above Tutay, 2600 m (Oct. 26, 1963, fr.); Hati Sar–Minchin Dhap, 2700–2900 m (Oct. 28, 1963, fr.); Minchin Dhap–Mul Pokhari, 2900–2500 m (Oct. 29, 1963, fl.); Thakma Khola, 2800 m (Nov. 12, 1963, fl., fr.); Halhale Bhanjang–Bhuspate Danra, 2900 m (Dec. 1, 1963, fr.).

Distr. Afghanistan, Himalaya, Khasia, Manipur, Tonkin, and W. China.

Some specimens resemble *G. sibiricum* L. f., but the typical form of the latter has a long tap root. The flowers are purple-rose, rosy, or whitish with purple veins. The relation between the Himalayan plants and the Japanese ones is discussed in a note on page 637.

Geranium polyanthes Edgeworth et Hook. f. in Fl. Brit. Ind. **1**: 431 (1874)–Knuth, l.c. 136 (1912).

Kala Pokhari–Sandakphu, 3400–3600 m (Sep. 16, 1964, fl., fr.).

Distr. Himalaya (Kumaon to Sikkim).

OXALIDACEAE (by Hiroshi Hara)

Biophytum sensitivum (L.) DC., Prodr. **1**: 690 (1824)–Fl. Brit. Ind. **1**: 436 (1874)–Knuth in Pfl.-reich IV–130, Ht. **95**: 393 (1930).

Oxalis sensitiva L., Sp. Pl. ed. 1, **1**: 434 (1753).

Phusri–Sanguri Bhanjang, 700 m (Oct. 16, 1963, fl.); Tamur Bridge–Dhankuta, 900 m (Oct. 17, 1963, fl. yellow).

Distr. sp. Tropical Africa, India (subtropical Himalaya south to Ceylon), Malaysia, east to China, and Formosa.

Oxalis Acetosella L., Sp. Pl. ed. 1, **1**: 433 (1753)–Knuth in Pfl.-reich IV–130, Ht. **95**: 931 (1930)–Hara in Journ. Fac. Sci. Univ. Tokyo Bot. **6**: 81 (1952); Enum. Sperm. Jap. **3**: 7 (1954).

Nayathang–Phalut, 3100–3500 m (Jun. 2, 1960); Phalut, 3500 m, in *Rhododendron* scrub (Jun. 4, 1960).

Distr. Temperate Eurasia, N. Africa, and c. & e. N. America.

The mother species was found at higher altitudes than subsp. *Griffithii* as observed also in Japan.

subsp. **Griffithii** (Edgew. et Hook. f.) Hara in Journ. Jap. Bot. **30**: 22 (1955).

Oxalis Griffithii Edgew. et Hook. f. in Fl. Brit. Ind. **1**: 436 (1874)-Knuth, l.c. 931 (1930).

O. Acetosella subsp. *japonica* Hara, l.c. 82 (1952); l.c. 8 (1954), excl. basionym.

Rimbick-Ramam, 1900-2400 m (May 7, 1960, fr.); Yoksam-Bakkim, 1700-2200 m (May 18, 1960); Bakkim-Jongri, 2200-3500 m (May 19, 1960, fr.); Garibans-Tonglu, 2800-3000 m (Jun. 7, 1960, fr.); Minchin Dhap-Mul Pokhari, 2900-2500 m (Oct. 29, 1963, fr.); Zongi-Iladanda, 2600-1800 m (Nov. 12, 1963); Bhandukay Bhanjang, 3100 m (Dec. 3, 1963).

Distr. E. Himalaya (Sikkim, Bhutan), Khasia, Manipur, N. Burma, W. & C. China, Formosa, and Japan.

The Eastern Himalayan plants agree well with the Japanese ones. See a note on page 638.

Oxalis corniculata L., Sp. Pl. ed. 1, **1**: 435 (1753)-Fl. Brit. Ind. **1**: 436 (1874)-Knuth, l.c. 146 (1930)-Hara in Journ. Jap. Bot. **24**: 101 (1949); Enum. Sperm. Jap. **3**: 8 (1954).

Yoksam, 1800 m (May 17, 1960, no. 612, fl., fr.); Darjeeling, 2100 m (Jun. 19 & 24, 1960, fl., fr.); Gangtok, 1650 m (Mar. 23, 1963, fl.); Kathmandu, 1400 m (Oct. 13, 1963, fl.); Dhankuta, 1200 m (Oct. 18 & 19, 1963, fr.); Bilbatay Bhanjang, 2200 m (Oct. 25, 1963, fl.); Tharpu-Changthaphu, 1200 m (Nov. 26, 1963, fr.).

Distr. sp. Almost cosmopolitan.

A larger part of our specimens has leaves hairy on both surfaces, and those from Yoksam and Darjeeling agree perfectly with typical var. *trichocaulon* Léveillé from Korea and Japan.

Oxalis corymbosa DC., Prodr. **1**: 696 (1824)-Young in Watsonia **4**: 62 (1958).

O. Martiana Zuccarini in Denkschr. Akad. Muench. **9**: 144 (1825)-Knuth, l.c. 250 (1930).

Near Saramsa Medicinal Garden, 1050 m (Jun. 17, 1960, fl.).

Distr. S. America; widely naturalized in Asia.

Oxalis latifolia H. B. K., Nov. Gen. et Sp. **5**: 184, t. 467 (1821)-Knuth, l.c. 273 (1930).

Darjeeling, 2150 m (Jun. 21, 1960, fl.); Illam, 1200 m (Dec. 7, 1963, fl.).

Distr. C. & S. Americas; naturalized in S. Europe and India.

LINACEAE (by Hiroshi Hara)

Reinwardtia Cicanoba (Hamilt. ex D. Don) Hara in Journ. Jap. Bot. **40**: 328 (1965).

Linum Cicanobum Hamilton ex D. Don, Prodr. Fl. Nepal. 217 (1825).

L. tetragynum Colebrooke in Wall., Cat. no. 1506 (1829), nom. nud.-Bentham in Bot. Reg. **16**: sub t. 1326 (1830)-G. Don, Gen. Hist. **1**: 452 (1831).

Reinwardtia tetragyna Planchon in Hook. Lond. Journ. Bot. **7**: 523 (1848)-Fl. Brit. Ind. **1**: 412 (1874)-Hallier in Beih. Bot. Centralbl. **39** (2): 5 (1921).

Dhankuta, 1200 m (Oct. 20, 1963, fl.); Illam-Ranga Pani, 400 m (Dec. 8, 1963, fl.).

Distr. E. Himalaya (Nepal, Sikkim), and W. China.

Reinwardtia indica Dumortier, Comm. Bot. 19 (1822).

Linum trigynum (non L. 1753) Roxburgh in Asiat. Research. **6**: 357 (1799).

Linum repens Hamilton ex D. Don, Prodr. Fl. Nepal. 217 (1825).

Reinwardtia trigyna (Roxb.) Planchon, l.c. 522 (1848)–Fl. Brit. Ind. **1**: 412 (1874)–Hallier, l.c. 5 (1921).

R. repens (D. Don) Planchon, l.c. 523 (1848).

Dhankuta, 1200 m (Oct. 19, 1963, fl.); Dhara Pani–Illam, 1500–1200 m (Dec. 5, 1963, fl.); Illam, 1200 m (Dec. 6, 1963, fl.).

Distr. Himalaya (Punjab to Sikkim), Assam, south to Nilghiris, Burma, Thai, Indo-China, and W. China.

RUTACEAE (by Hiroo Kanai)

Aegle Marmelos (L.) Correa in Trans. Linn. Soc. **5**: 222 (1800)–Fl. Brit. Ind. **1**: 516 (1875).

Crataeva Marmelos L., Sp. Pl. ed. 1, **1**: 444 (1753).

Phusri, 500 m (Oct. 16, 1963, fr.); Dhankuta, 1200 m (Oct. 19, 1963, fr.); Sanichare, 200 m (Dec. 10, 1963).

Distr. India, Burma, Indo-China, Thai, and Indonesia.

Boenninghausenia albiflora (Hook.) Meisner, Pl. Vasc. Gen. **2**: 44 (1836)–Fl. Brit. Ind. **1**: 486 (1875), p.p.–Engler, Pfl.-fam. ed. 2, **19 a**: 243 (1931).

Ruta albiflora Hook., Exot. Fl. **1**: t. 79 (1823).

Dentam–Pamianchi, 1500–2000 m (May 12, 1960); Damthang–Temi, 2200–1800 m (Mar. 25, 1963, fr.); Kathmandu–Thankot, 1300 m (Sep. 20, 1963, fr.); Gokarna Forest, 1300 m (Sep. 22, 1963, fl.); Pouwa, Kathmandu, 1600 m (Oct. 9, 1963, fr.); Sanguri Bhanjang, 1000m (Oct. 16, 1963, fl.); Sinduwa, 2100m (Oct. 24, 1963, fr.); near Sinduwa, 2100 m (Oct. 24, 1963, fl.); Minchin Dhap–Mul Pokhari, 2700 m (Oct. 29, 1963, fr.); Tuwa–Taplethok, 1400 m (Nov. 5, 1963, fl.); Helok–Iladanda, 1700 m (Nov. 8, 1963, fr.); Yektin–Akasay, 1700 m (Nov. 30, 1963, fr.); Senchal–Ghum, 2300 m (Sep. 19, 1964, fl.).

Distr. Himalaya (N. W. to Sikkim), Thai, China, Formosa, Java, and Philippines.

The hairiness on the petiole and the length of the stipe of capsule are so variable that there is no distinguishable form in these respects. While var. *japonica* (Nakai) S. Suzuki has no hairs on the petiole even in the young stage.

Citrus Aurantium L., Sp. Pl. ed. 1, **2**: 782 (1753)–Fl. Brit. Ind. **1**: 515 (1875)–Hara, Enum. Sperm. Jap. **3**: 14 (1954).

Gangtok–Saramsa Medicinal Garden, 1000 m (Jun. 17, 1960, fr.); Tharpu–near Chyangthaphu, 1000 m (Nov. 26, 1963, fr.).

Distr. Foot of Himalaya, Assam, Burma, China, and Indo-China. Cultivated.

Citrus Hystrix DC., Cat. Hort. Monsp. 97 (1813); Prodr. **1**: 539 (1824)–Fl. Brit. Ind. **1**: 515 (1875).

Iladanda–Helok, cult., 1700 m (Nov. 13, 1963, fr.).

Distr. E. Himalaya (Nepal), Khasia, Burma, Thai, Indo-China, and Sumatra. Cultivated.

Citrus medica L., Sp. Pl. ed. 1, **2**: 782 (1753)–Fl. Brit. Ind. **1**: 514 (1875).

Kurseong–Siliguri, 500 m (Jun. 29, 1960, fl.); Sanichare–Sibganja, cult., 200 m

(Dec. 11, 1963, fl.).

Distr. Foot of Himalaya, Central India, Burma, and Indo-China.

Evodia fraxinifolia (D. Don) Hook. f., Fl. Brit. Ind. **1**: 490 (1875)–Guillaumin in Fl. Gén. Indo-Chin. **1**: 635 (1911).

Rhus fraxinifolium D. Don, Prodr. Fl. Nepal. 248 (1825).

Kiwa–Taplethok, 1300 m (Nov. 5, 1963, fr.); Helok, 1500 m (Nov. 9, 1963, fr.); Yamphodin–Ghatte, 2200 m (Nov. 18, 1963, fr.).

Distr. E. Himalaya, Khasia, Burma, Indo-China, and China.

Fagara oxyphylla (Edgew.) Engler, Pfl.-fam. III, **4**: 118 (1896).

Zanthoxylum oxyphyllum Edgew. in Trans. Linn. Soc. **20**: 42 (1851)–Fl. Brit. Ind. **1**: 494 (1875)–Basu, Ind. Med. Pl. 250, pl. 187 (1918).

Birch Hill, Darjeeling, 2000 m (Apr. 7, & Jun. 18, 1960, fl. & fr.); Batasi, 2000 m (May 2, 1960, no. 31, fl.); Dentam–Pamianchi, 2000 m (May 12, 1960, fr.); Ghum–Kurseong, 2000 m (Jun. 22, 1960, fr.); Murhay, 2000 m (Oct. 23, 1963, fr.); Sinduwa, 2100 m (Oct. 24, 1963, fr.); Bilbatay Bhanjang, 2600 m (Oct. 26, 1962, fr.); Mul Pokhari–Gorzu Kosir, 2200 m (Oct. 30, 1963, fr.); Bhandukay Camp, 2400 m (Nov. 16, 1963, fr.); Birwa–Yektin, 2300 m (Nov. 28, 1963, fr.); Akasay, 2000 m (Nov. 30, 1963, fr.); Bhandukay Bhanjang–Mai Majuwa, 2500 m (Dec. 3, 1963, fr.); Senchal, Darjeeling, 2300 m (Dec. 27, 1963, fr.).

Distr. Himalaya, Khasia, and Burma.

Micromelum integerrimum (Roxb.) Wight et Arn. ex M. Roemer in Fam. Nat. Reg. Veg. **1**: 47 (1846); Wight et Arn., Prodr. Fl. Ind. Orient. **1**: 94 (1834)–T. Tanaka in Journ. Ind. Bot. Soc. **16**: 227 (1937).

Berger integerrima Roxb., Fl. Ind. ed. 2, **2**: 376 (1832).

M. pubescens Hook. f. in Fl. Brit. Ind. **1**: 501 (1875), non Blume, p.p.

Tista, Darjeeling, 300 m (Apr. 26, 1960, fr.); Siliguri, 300 m (Apr. 29, 1960, fr.); Tingling Bridge, 1000 m (May 15, 1960, no. 277, fr.); Middle Camp, Singtam–Gangtok, 700 m (Mar. 29, 1963, fr.).

Distr. N. W. India, E. Himalaya (Nepal, Sikkim), Assam, Bengal, Bihar, Andaman, and Burma.

Murraya exotica L., Mant. Pl. **2**: 563 (1771)–Fl. Brit. Ind. **1**: 502 (1875).

Biratnagar, 200 m (Oct. 14, 1963, fl.).

Distr. India, Ceylon, Burma, Thai, Indo-China, Malay Archip., New Guinea, and Australia.

Skimmia arborescens T. And. ex Gamble in Journ. Linn. Soc. **43**: 491 (1916)–Huang in Act. Phytotax. Sin. **7**: 346, t. 66, f. 2 (1958)–Hara in Journ. Jap. Bot. **40**: 98 (1965).

S. Wallichii Hook. f. et Thoms. ex Gamble in Journ. Linn. Soc. **43**: 492 (1916), quoad specim. typic. ex Nepalia et Bootan.

Palmajua–Rimbick, 2000 m (May 5, 1960, fr.); Chia Bhanjang–Dentam, 2500 m (May 11, 1960, fr.); Tendong Peak, 2700 m (Mar. 26, 1963, bud); Bilbatay Bhanjang, 2200 m (Oct. 25, 1963, bud); Bilbatay Bhanjang–Tinjuray, 2400 m (Oct. 27, 1963, fr.); Baroya Khimty, 2500 m (Nov. 11, 1963, bud); Helok–Baroya Khimty, 2500 m (Nov. 15, 1963, fr.); Darjeeling, 2200 m (Dec. 26, 1963, bud).

Distr. Himalaya (Nepal to Bhutan), Assam, Thai, and China.

Skimmia melanocarpa Rehd. et Wils. in Pl. Wilson. **2**: 138 (1914), p.p.–

Hand.-Mzt., Symb. Sin. **7**: 629 (1933)–Huang in Act. Phytotax. Sin. **7**: 349, t. 67, f. 2 (1958)–Hara in Journ. Jap. Bot. **40**: 99 (1965).

S. Wallichii Hook. f. et Thoms. ex Gamble, Journ. Linn. Soc. **43**: 492 (1916), excl. typo–Kanai in Journ. Fac. Sci. Univ. Tokyo Bot. **8**: 325 (1963).

Ramam, 2400 m (May 8, 1960, fr.); Bakkim–Jongri, 2800 m (May 19, 1960, fr.); Chia Bhanjang, 3100m (Jun. 2, 1960, fr.); Sandakphu–Garibans, 2800m (Jun. 7, 1960, fr.); Minchin Dhap–Mul Pokhari, 2700 m (Oct. 29, 1963, fr.); Thakma Khola, 3000 m (Nov. 13, & 17, 1963, bud, & fr.); Diorali Bhanjang, 3000 m (Nov. 14, 1963, bud); Baroya Khimty–Thakma Khola, 2700 m (Nov. 16, 1963, bud); Siling Tzokupa, 3000 m, & 2900 m (Nov. 21, 1963, fr.); Batasay–Bhuspate Danra, 2600 m (Dec. 1, 1963, bud).

Distr. E. Himalaya (Nepal to Bhutan), N. Assam, N. Burma, and W. China.

Toddalia asiatica (L.) Lam., Tab. Encycl. **2**: 116 (1797).

Paulinia asiatica L., Sp. Pl. ed. 1, **1**: 365 (1753).

T. aculeata Pers., Syn. Pl. **1**: 249 (1805)–Fl. Brit. Ind. **1**: 497 (1875).

Dentam–Pamianchi, 1700 m (May 12, 1960, no. 216, fr.); Gangtok, 1700 m (Jun. 15 & 17, 1960, fr.); Gangtok–Saramsa Medicinal Garden, 1500m (Jun. 17, 1960, fr.); Dumhan–Taplejung, 1400 m (Nov. 1, 1963, bud); Taplethok–Helok, 1500 m (Nov. 6, 1963, bud); Ghatte–Khebang, 1800 m (Nov. 19, 1963, bud); Khebang–below Siling Tzokupa, 1700 m (Nov. 20, 1963, bud); below Siling Tzokupa–Khebang, 1800 m (Nov. 22, 1963).

Distr. Tropical Africa, Subtropical Himalaya, Khasia, Western Peninsula, Ceylon, Burma, Indo-China, Thai, China, and Malaysia.

Zanthoxylum acanthopodium DC., Prodr. **1**: 727 (1824)–Fl. Brit. Ind. **1**: 493 (1875)–Hartley in Journ. Arn. Arb. **47**: 209 (1966).

St. Paul Hill, Darjeeling, 2000 m (Apr. 7, 1960, fr. & bud); Palmajua–Rimbick, 2000 m (May 5, 1960, fr.); Murhay, 2100 m (Oct. 22 & 23, 1963, bud); Sinduwa, 2100 m (Oct. 24, 1963, fl.); Dumhan–Taplejung, 1400 m (Nov. 1, 1963, fl.); Bhandukay, 2500 m (Nov. 16, 1963, st.); Bhandukay Camp, 2400 m (Nov. 16, 1963, fr.); Bhandukay Bhanjang–Mai Majuwa, 2300 m & 2000 m (Dec. 3, 1963, fr. & fl.); Birch Hill, 2100 m (Dec. 28, 1963, fl.).

Distr. Himalaya (Kumaon to Sikkim), Khasia, Burma, Thai, Indo-China, W. China, and Sumatra.

Zanthoxylum armatum DC., Prodr. **1**: 727 (1824)–Hartley, l.c. 211 (1966).

Z. alatum Roxb., Fl. Ind. ed. 2, **3**: 768 (1832)–Fl. Brit. Ind. **1**: 493 (1875)–Basu, Ind. Med. Pl. 249, pl. 184 (1918)–Guillaum. in Fl. Gén Ind.-Chin., Suppl. **1**: 604 (1946).

Naya Bazar–Namchi, 1000 m (Mar. 27, 1963, fl.); Chobar Gorge, South of Kathmandu, 1200 m (Sep. 21, 1963, fr.); Dhankuta, 1200 m (Oct. 19, 1963, fr.).

Distr. Subtropical Himalaya, Khasia, Burma, Thai, Tonkin, China, Formosa, Japan?, Philippines, and Lesser Sunda Is.

Zanthoxylum ovalifolium Wight, Ill. Ind. Bot. **1**: 169 (1839)–Fl. Brit. Ind. **1**: 492 (1875)–Hartley, l.c 207 (1966).

Takdah–Rayang, 250 m (Apr. 20, 1960, no. 2194, bud); Rayang, 250 m (Apr. 21, 1960, no. 1832, fl.).

Distr. Sikkim, Khasia, Nilghiris, Burma, Java to N. Queensland.

SIMARUBACEAE (by Hiroo Kanai)

Brucea mollis Wall. [Cat. no. 8483 (1847–49), nom. nud.] ex Kurz in Journ. Asia. Soc. Beng. **42** (2): 64 (1874)–Fl. Brit. Ind. **1**: 521 (1875)–Engler, Pfl.-fam. ed. 2. **19 a**: 386 (1931)–Fl. Males. **6**: 212 (1962).

Tista, 300 m (Jun. 20, 1960, fr.).

Distr. E. Himalaya (Sikkim and Bhutan), Assam, and Burma.

BURSERACEAE (by Hiroo Kanai)

Garuga pinnata Roxb. [Hort. Beng. 33 (1814), nom. nud.] Pl. Corom. **3**: 5, t. 208 (1819)–Fl. Brit. Ind. **1**: 528 (1875)–Guil. in Fl. Gén. Ind.-Chin. **1**: 720 (1911).

Tista, 300 m (Jun. 19, 1960, fr.).

Distr. India, Burma, Thai, Indo-China, and Malaysia.

MELIACEAE (by Hiroo Kanai)

Cedrela Toona Roxb. ex Rottl. et Willd. in Gesell. Nat. Freund. N. Schr. **4**: 198 (1803)–Wight, Icon. **1**: t. 161 (1839)–Fl. Brit. Ind. **1**: 568 (1875).

Toona ciliata M. Roem., Syn. Hesper. **1**: 139 (1846)–Harms in Engl., Pfl.-fam. ed. 2, **19 b I**: 45 (1940).

Sibganja–Mahara Bahara, 200 m (Dec. 12, 1963).

Distr. Afghanistan, Himalaya, India, Burma, Thai, S. China, Java, New Guinea, and Australia.

Cipadessa baccifera (Roth) Miq., Ann. Mus. Bot. Lugd.-Bat. **4**: 6 (1863)–Harms, l.c. 93, f. 21 A–D (1940).

Melia baccifera Roth, Nov. Sp. 215 (1821).

C. fruticosa Blume, Bijdr. 162 (1825)–Fl. Brit. Ind. **1**: 545 (1875).

Phusri–Sanguri Bhanjang, 700 m (Oct. 16, 1963); Sanguri Bhanjang, 1200 m (Oct. 16, 1963); Dhara Pani, 1000 m (Oct. 17, 1963).

Distr. India, Ceylon, Burma, Thai, Indo-China, Malaysia, and W. & S. China.

Melia dubia Cav., Diss. **7**: 364 (1789)–Fl. Brit. Ind. **1**: 545 (1875)–Basu, Ind. Med. Pl. pl. 220 (1918).

Khebang–Bharomdin, 1300 m (Nov. 24, 1963); Bharomdin–Tharpu, 1000 m (Nov. 25, 1963).

Distr. Tropical Asia, Australia, and Africa.

Walsura trijuga (Roxb.) Kurz in Journ. Asia. Soc. Beng. **44**: 11 (1875).

Heynea trijuga Roxb. [Hort. Beng. 33 (1814), nom. nud.] in Bot. Mag. t. 1738 (1815)–Fl. Brit. Ind. **1**: 565 (1875).

Tista, Darjeeling, 500 m (Jun. 19, 1960); Phusri, 500 m (Oct. 16, 1963); Sanguri Bhanjang–Dhara Pani, 1100 m (Oct. 16, 1963); Tharpu, 1200 m (Nov. 26, 1963); Tharpu–near Chyangthaphu, 1000 m (Nov. 26, 1963).

Distr. Bengal, Nepal, Bhutan, Khasia, Burma, Malaya, Indo-China, China (Yunnan), and Sumatra.

MALPIGHIACEAE (by Hiroo Kanai)

Aspidopterys nutans Hook. f., Fl. Brit. Ind. **1**: 421 (1874)–Hutchinson in Kew Bull. **1917**: 98 (1917).

Phusri–Sanguri Bhanjang, 1100 m (Oct. 16, 1963, fr.); Dhara Pani–Tamur Bridge, 600 m & 500 m (Oct. 17, 1963, fr.); Ghorwa–Sanichare, 300 m (Dec. 10, 1963, fr.).

Distr. E. Himalaya (E. Nepal, Sikkim), Assam, Burma, Thai, and Indo-China.

POLYGALACEAE (by Hiroo Kanai)

Polygala arillata Hamilton ex D. Don, Prodr. Fl. Nepal. 199 (1825)–Fl. Brit. Ind. **1**: 200 (1872)–Mukherjee in Bull. Bot. Soc. Beng. **12**: 31 (1958).

Gangtok, 1500 m (Jun. 15, 1960, fl.); Penlong La, Gangtok, 2100 m (Jun. 16, 1960, fl.); Darjeeling, 2100 m (Jun. 19, 1960, fl.); Baroya Khimty, 2500 m (Nov. 12, 1963, fr.); Baroya Khimty–Thakma Khola, 2600 m (Nov. 16, 1963, fr.); Ghatte–Khebang, 2100 m (Nov. 19, 1963, fr.).

Distr. Himalaya (from Nepal eastwards), Assam, S. India, Burma, Thai, Indo-China, China (Yunnan, Kwangtung), and Malay.

Polygala chinensis L., Sp. Pl. ed. 1, **2**: 704 (1753).

var. **latifolia** (Chodat) Mukherjee in Bull. Bot. Soc. Beng. **12**: 40 (1958).

P. densiflora Bl. var. *latifolia* Chodat in Mém. Soc. Phys. Hist. Nat. Genève **31** (2): 380 (1893).

Bharomdin–Tharpu, 1100 m (Nov. 25, 1963); Tharpu–Chyangthaphu, 1000 m (Nov. 26, 1963); Illam–Jog Mai, 800 m (Dec. 8, 1963).

Distr. var. E. Himalaya, Assam, and Burma.

var. **linarifolia** (Willd.) Chodat in Mém. Soc. Phys. Hist. Nat. Genève **31** (2): 381 (1893)–Mekherjee, l.c. 40 (1958).

P. linarifolia Willd., Sp. Pl. **3**: 877 (1803).

Bagdogra, 200 m (Jun. 27, 1960); Tamur Bridge–Dhankuta, 1000 m (Oct. 17, 1963).

Distr. var. Himalaya (N. W. to Assam), and India.

Polygala persicariaefolia DC., Prodr. **1**: 326 (1824)–Fl. Brit. Ind. **1**: 202 (1872)–Mukherjee, l.c. 45 (1958).

Chobar Gorge, south of Kathmandu, 1200 m (Sep. 21, 1963); Dhankuta, 1200 m (Oct. 21, 1963); Helok–Iladanda, 1800 m (Nov. 8, 1963).

Distr. Nepal, India, and Burma.

Salomonia edentula DC., Prodr. **1**: 334 (1824)–Fl. Brit. Ind. **1**: 206 (1872).

Pouwa, Kathmandu, 1600 m (Oct. 9, 1963).

Distr. Nepal.

EUPHORBIACEAE (by Isao Hurusawa & Yasuyoshi Tanaka)

Alchornea mollis (Benth.) Muell.-Arg. in Linnaea **34**: 168 (1865); in DC., Prodr. **15** (2): 902 (1866)–Hook. f., Fl. Brit. Ind. **5**: 420 (1887).

Stipellaria mollis Benth. in Hook., Journ. Bot. **6**: 3 (1854).

Tharpu–near Chyangthaphu, 1200–1100 m (Nov. 26, 1963).

Distr. C. and E. Himalaya (Nepal, Sikkim), and Assam.

Aleurites cordata (Thunb.) R. Br. ex Steud., Nomencl. ed. 2, **1**: 49 (1840).

Dryandra cordata Thunb., Nov. Gen. Pl. **3**: 60 (1783).

Saramsa Medicinal Garden, 800 m, cult. (Jul. 17, 1960).

Distr. Tropical and subtropical India, and China.

Antidesma acuminatum Wall. in Wight, Icon. **6**: t. 1991 (1853)–Muell.-Arg. in DC., Prodr. **15** (2): 268 (1866)–Fl. Brit. Ind. **5**: 363 (1887), p.p.–Pax et K. Hoffm. in Pfl.-reich IV–147–XV, Ht. **81**: 127 (1922).

Ranga Pani–Ghorwa, 700–300 m (Dec. 9, 1963).

Distr. Tropical E. Himalaya to North East Malaya, and Burma.

Antidesma diandrum (Roxb.) Roth., Nov. Spec. 369 (1821)–Pax et Hoffm., l.c. 143 (1922), incl. var. *ovatum*, var. *lanceolatum* et var. *parvifolium* Tulasne; in Ann. Sci. Nat. sér. 3, **15**: 198, 199 (1850).

Stilago diandra Roxb., Pl. Corom. **2**: t. 166 (1802).

Tharpu–near Chyangthaphu, 1200–1100 m (Nov. 26, 1963).

Distr. Tropical E. Himalaya, Assam, South West Malaya, Java, Burma, Thai, and S. China (Yunnan, Hainan).

Arachne cordifolia (Decne.) Hurusawa in Journ. Fac. Sci. Univ. Tokyo Bot. **6**: 339 (1954).

Leptopus cordifolia Decne. in Jaquemont, Voy. Ind. **4**: 155 (1844).

Andrachne cordifolia (Decne.) Muell.-Arg. in DC., Prodr. **15** (2): 234 (1866).

A. Decaisneana Baill., Étud. Gén. Euphorb. 577 (1858).

Godavari, near Kathmandu, 1500 m (Sep. 18, 1963).

Distr. Afghanistan, and Temperate Himalaya (Nepal).

Baccaurea sapida (Roxb.) Muell.-Arg. in DC., Prodr. **15** (2): 459 (1866)–Fl. Brit. Ind. **5**: 371 (1887)–Pax et Hoffm., l.c. 52 (1922).

Pierardia sapida Roxb., Fl. Ind. ed. 2, **2**: 254 (1832).

P. macrostachya Wight et Arn. in Wight, Icon. **5**: t. 1912 & 1913 (1852).

Baccaurea propinqua Muell.-Arg. in DC., Prodr. **15** (2): 463 (1866).

B. macrostachya (Wight et Arn.) Hook. f., Fl. Brit. Ind. **5**: 371 (1887).

Rayang, 250 m (Apr. 21, 1960).

Distr. E. Himalaya (Assam), Yunnan, Burma to India, and Malaya (Malacca, Andaman).

Baliospermum corymbiferum Hook. f., Fl. Brit. Ind. **5**: 463 (1887)–Pax et K. Hoffm. in Pfl.-reich IV–147–IV, Ht. **52**: 26 (1912).

Gangtok, 1600 m (Jun. 15, 1960).

Distr. Tropical E. Himalaya (E. Nepal, Sikkim).

Baliospermum montanum (Willd.) Muell.-Arg. in DC., Prodr. **15** (2): 1125 (1866)–Pax et K. Hoffm., l.c. 25 (1912).

Jatropha montana Willd., Sp. Pl. **4**: 563 (1805).

Baliospermum axillare Blume, Bijdr. 604 (1826)–Fl. Brit. Ind. **5**: 461 (1887).

B. moritzianum Baill., Étud. Gén. Euphorb. 395 (1858).

Croton polyandrus Roxb., Fl. Ind. ed. 2, **3**: 682 (1832).

Illam–Ranga Pani, 1200–700 m (Dec. 8, 1963); Ranga Pani–Ghorwa, 700–300 m (Dec. 9, 1963).

Distr. Tropical Himalaya to India, North West Malaya, Burma, Thai, Sumatra, and Java.

Baliospermum nepalense Hurusawa et Ya. Tanaka, sp. nov. [Fig. 20]

Ramuli crassi diametro circ. 4–8 mm juniores fulvo pilosi mox plus minus glabrati. Petioli 3–12 cm longi, terminales breviores circ. 1 cm longi. Limbus elliptico-oblongus, caudato-acuminatus, basi rotundatus saepe subcordatus vel late cuneatus, vulgo 10–15 cm, saepe ad 25 cm longus, 8–10 cm latus, glanduloso-dentatus membranaceus, juvenilis pubescens mox glabrior et infra secus nervis pilosiusculus, basi triplinervius biglandulosus vel rarius nullus, subtus nervis prominentibus, costis secundariis utrinque

8–9 venulis reticulatis. Inflorescentia axillaris folia superans vel fere aequans, floribus dioicis; Mascula cum pedunculo 10–30 cm longa, floribus junioribus atque apicem versus puberulis, paniculatis ad supra ramificata partem congestis, parte florifera inflorescentiae 4–7 cm longa, ramulis 2–3 cm longis, bracteis sublato-lanceolatis 1 mm longis, pedicellis 2 mm longis glabratis, calycibus imbricatis, staminibus circ. 15; Discus liber episepalus; Feminea (inflorescentia) cum pedunculo 5–25 cm longa parce puberula, bracteis triangularilanceolatis 5–10 mm longis 1 mm latis, floribus (femineis) 7 mm diametientibus, calycibus 5–6 lanceolato-deltoideis, acutis extus puberulis, 5 mm longis margine interdum leviter glandulosis, bracteas subaequantibus, receptaculo convexiusculo disciforme. Discus inaequalis ovatus vel glanduliformis. Styli bipartiti. Ovarium glabrum. Capsula profunde sulcato-tridyma 9 mm lata 6 mm longa. Seminum laeve brunnescens subglobosum 5 mm longum.

Ex affine *Baliosp. Balansae* Gagnep. in Bull. Soc. Bot. France **72**: 460 (1925) differt inflorescentia mascula minore 20–35 mm. longa et racemoso-spiciforme.

Below Mai Majuwa–Dhara Pani, 1600–1500 m (Dec. 4, 1963—Typus in TI).

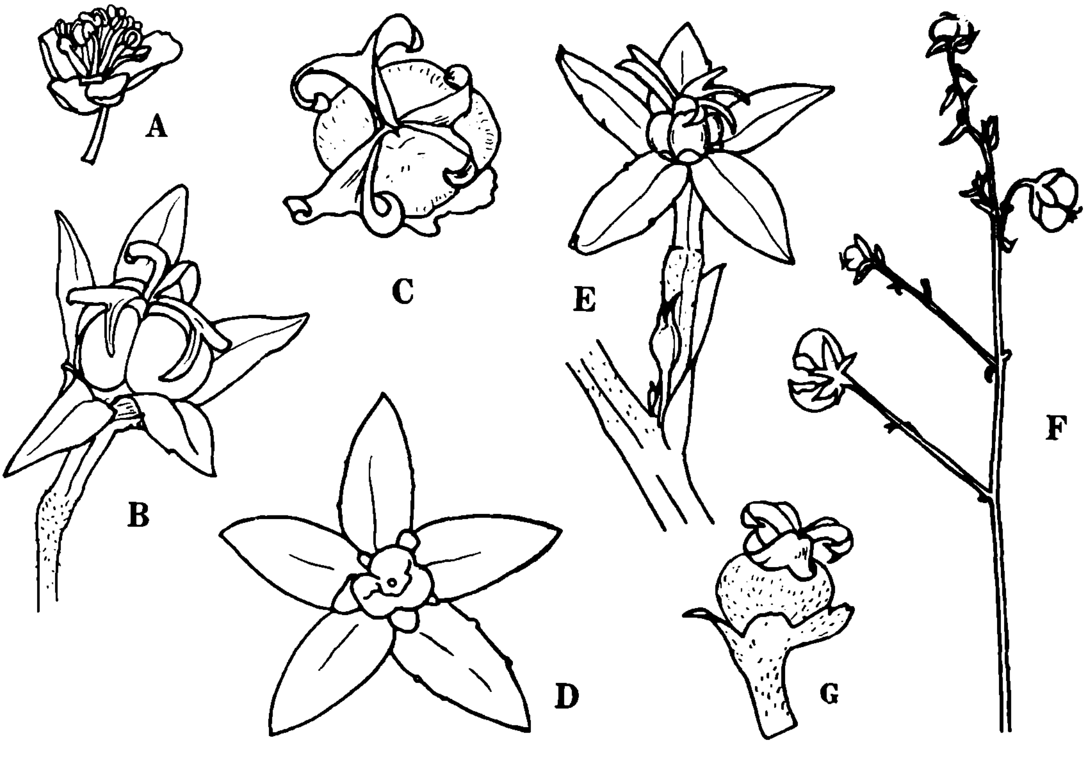

Fig. 20. *Baliospermum nepalense* Hurusawa et Ya. Tanaka. A. Flos masculinus. B. Flos foemineus, pistillo submaturo. C. Flos foemineus, pistillo maturo: discus pr. part. visus. D. Flos foemineus, pistillo amoto: discus visus. E. Flos foemineus juvenilis cum alabastro. F. Fructescentia. G. *Baliospermum montanum* (Willd.) Muell.-Arg. Flos foemineus pro comparatione.

Breynia rhamnoides (Willd.) Muell.-Arg. in DC., Prodr. **15** (2): 440 (1866).
Phyllanthus rhamnoides Willd., Sp. Pl. **4**: 580 (1805).
Malantkesa rhamnoides Wight, Icon. t. 1898 (1852).
Biratnagar, 200 m (Dec. 13, 1963); Kathgara–Rangali, 200 m (Dec. 14, 1963).

Distr. Tropical and subtropical Asia (incl. Formosa, Ryukyu, Amami-Oshima).

Bridelia retusa Spreng., Syst. Veg. **3**: 48 (1829)–Baill., Étud. Gén. Euphorb. t. 25, f. 25–34 (1858)–Thwaites, Enum. Zeyl. 279 (1864)–Muell.-Arg. in DC., l.c. 493 (1866), incl. var.–Fl. Brit. Ind. **5**: 268 (1887).

Dhankuta, 1200 m (Oct. 19, 1963); Sibganja–Gauriganja, 200 m (Dec. 12, 1963); Rangali–Biratnagar, 200 m (Dec. 15, 1963).

Distr. Tropical E. Himalaya, Ceylon to Malaya, Burma, and Thai.

Bridelia stipularis (L.) Blume, Bijdr. 597 (1825)–Muell.-Arg. in DC., Prodr. **15** (2): 499 (1866), p.p.–Fl. Brit. Ind. **5**: 270 (1887), p.p.

Cluytia stipularis L., Mant. Pl. **1**: 127 (1767)–Willd., Sp. Pl. **4** (2): 883 (1805).

Illam—Ranga Pani, 1200–700 m (Dec. 8, 1963); Ranga Pani–Ghorwa, 700–300 m (Dec. 9, 1963); Ghorwa–Sanichare, 300–200 m (Dec. 10, 1963); Gauriganja–Rangali, 200 m (Dec. 13, 1963).

Distr. Tropical E. Himalaya to India, Burma, Malaya, Thai, and W. China (Yunnan). And (distributio geographica diversa) Philippines (subsp. *philippinensis* Jablonszky).

Bridelia tomentosa Blume, Bijdr. 597 (1825)–Muell.-Arg. in DC., Prodr. **15** (2): 501 (1866), p.p.–Fl. Brit. Ind. **5**: 271 (1887)–Hayata in Journ. Coll. Tokyo **20** (3): 30, t. III-A (1904)–Gard. Bull. **10**: 291 (1939).

Clutia monoica Loureiro, Fl. Cochinch. 638 (1790).

Bridelia monoica Merrill, Philipp. Journ. Sci. **13**: 142 (1918), excl. syn.

Ranga Pani–Ghorwa, 700–300 m (Dec. 9, 1963); Ghorwa–Sanichare, 200m (Dec. 10, 1963); Sibganja–Mahara Bahara (Dec. 12, 1963); Gauriganja–Rangali (Dec. 13, 1963); Kathgara–Rangali, 200m (Dec. 14, 1963).

Distr. Tropical and subtropical Asia (Java, Sumatra, Burma, Thai, Formosa, and Ryukyu) to New Guinea, Northern Australia (var. *trichadenia* Muell.-Arg.).

Chamaesyce hirta (L.) Millsp. in Publ. Field Mus. Bot. ser. **2**: 303 (1909)–Hurusawa in Journ. Fac. Sci. Univ. Tokyo Bot. **6** (6): 277 (1954).

Euphorbia hirta L., Sp. Pl. ed. 1, 454 (1753).

Rayang, Darjeeling, 250 m (Apr. 23, 1960); Rangpo–Tista, 400–300 m (Jun. 18, 1960); Kathmandu Airport (Oct. 13, 1963); Dumhan, by the Tamur River, 700m (Oct. 31, 1963); Khebang–bellow Siling Tzokupa (Nov. 20, 1963); Tharpu, 1200 m (Nov. 26, 1963).

Distr. Pantropic and subtropic; and southern Japan (common in Prov. Izu, Isl. Hachijo and S. Kyushu, but in Shikoku and prov. Kii not so often).

Chamaesyce prostrata (Aiton) Small, Fl. Southeast. U.S. 713 (1903)–Hurusawa, l.c. 287 (1954).

Euphorbia prostrata Aiton, Hort. Kew. **2**: 139 (1789); l.c. ed. 2, **3**: 161 (1811).

Kathmandu Airport (Oct. 13, 1963); Dhankuta, 1200 m (Oct. 19, 1963).

Distr. E. India, S. China, Formosa, Ryukyu, Bonin Is., and tropical America.

Chamaesyce supina (Rafin.) Moldenke, Annot. List Moldenke Coll. 135 (1939)–Hara in Journ. Jap. Bot. **16**: 119 (1940)–Hurusawa, l.c. (1954).

Euphorbia supina Rafinesque, Amer. Month. Mag. **2**: 119 (1817).

E. maculata (non L. nec Willd., Sp. Pl. **2** (2): 896, 1799) sensu Jacquin, Hort. Bot. Vindob. **2**: 87, t. 186 (1772)–Boissier in DC., Prodr. **15** (2): 46 (1866).

Dumhan, by the Tamur River, 700 m (Oct. 31, 1963).

Distr. Tropical and subtropical regions.

Croton caudatus Geisel, Monogr. Croton 73 (1807)-Muell.-Arg. in DC., l.c. 599 (1866)-Fl. Brit. Ind. **5**: 388 (1887).

Takdah-Rayang, 250–300 m (Apr. 20, 1960, no. 2179); Tista, 350 m (Jun. 19, 1960); Illam-Ranga Pani, 1200–700 m (Dec. 8, 1963).

Distr. E. Himalaya to India, Java, and Philippines.

Croton spiciflorus Thunb., Fl. Javan. 23 (1825).

Biratnagar, 200 m (Oct. 14, 1963).

Distr. Native of South America.

Croton Tiglinum L., Sp. Pl. ed. 1, 1004 (1753)-Muell.-Arg. in DC., Prodr. **15** (2): 600 (1866).

Dentam-Pamianchi, 1500–2000 m (May 12, 1960, no. 237).

Distr. E. Himalaya, India, Burma, Malaya, S. China, and Formosa. Long since naturalized or cultivated.

Eriococcus Hamiltonianus (Muell.-Arg.) Hurusawa et Ya. Tanaka, comb. nov.

Agyneia tetrandra Hamilt. in Trans. Linn. Soc. **15**: 125 (1826).

Phyllanthus Hamiltonianus Muell.-Arg. in Linnaea **34**: 75 (1863)-Fl. Brit. Ind. **5**: 304 (1887).

P. sikkimensis Muell.-Arg. l.c. 48 (1863).

Siliguri, 200 m (Jun. 29, 1960); Tuwa–Taplethok, 1800–1300 m (Nov. 5, 1963).

Distr. E. Himalaya (Nepal, Sikkim, Assam).

Flueggea virosa (Roxb.) Baillon, Étud. Gén. Euphorb. 593, t. 26, f. 39–43 (1858), nec sensu DC. (hic excl. synon. *F. microcarpa* Blume).

Phyllanthus virosus Roxb., Fl. Ind. ed. 2, **3**, 826 (1832).

Kalimpong, 1300 m (Apr. 23, 1960); Tista, 350 m (Jun. 20, 1960); Pamianchi–Tingling Bridge, 2000–1000 m (May 15, 1960, no. 255).

Distr. Tropical Africa (Abyssinia), Australia, and tropical and subtropical Asia (incl. Malay Is., S. China, Formosa and Ryukyu).

Glochidion assamicum (Muell.-Arg.) Hook. f., Fl. Brit. Ind. **5**: 319 (1887).

Phyllanthus assamicus Muell.-Arg. in Flora **48**: 378 (1865); in DC., Prodr. **15** (2): 297 (1866).

var. **brevipedicellatum** Hurusawa et Ya. Tanaka, var. nov.

Pedicellus flors masculini brevior vix 10 mm longus. Sepala florum masc. ca. 2 mm longa. Folia 8–12 cm longa 3–4.5 cm lata glabra. Characteribus ceteris propius ad var. *magnicapsulum* (planta formosana) quam ad var. *assamicum* (typicum) accedit. A var. *magnicapsulo* capsula non pubescente et minore recedit.

Darjeeling: Takdah, 1500 m (Apr. 20, 1960, no. 2191—Typus in TI).

Distr. sp. India, W. China (Yunnan), Indo-China, and Formosa.

Glochidion metanubigenum Hurusawa et Ya. Tanaka, sp. nov.

Folia glabra 7–10 cm longa 3–5 cm lata oblongolanceolata, apice acuta basi obtuse cuneata vel rotundata, costis lateralibus prominentibus 5–6 jugatis, subtus nervis clare reticulatis, petiolis 5 mm longis. Ramuli juveniles pubescentes vel puberuli flexuosi. Flores masculini nudi, calycibus diametro 5–8 mm latis, pedicellis 3–10 mm longis. Flores foeminei sessiles, sepalis 4 (rarius 5) haud apiculatis. Habitu et ambitu foliorum *Gl. nubigeo* affine, differt autem ex eo qualitate folii non coriacei nec chartacei sed sub-

membranacei, et characteribus floris masculini.

East Nepal: Ghatte–Khebang, 1600–2400 m (Nov. 19, 1963—Typus in TI); Mai Majuwa–Dhara Pani, 1500–1600 m (Dec. 4, 1963).

Glochidion multiloculare Muell.-Arg. in Linnaea **32**: 59 (1863)–Fl. Brit. Ind. **5**: 307 (1887).

Phyllanthus multilocularis Muell.-Arg. in DC., Prodr. **15** (2): 279 (1866).

Kathgara–Rangali, 200 m (Dec. 14, 1963), Rangali–Biratnagar, 200 m (Dec. 15, 1963).

Distr. Tropical Himalaya, India, and N. Burma.

Glochidion nubigenum Hook. f., Fl. Brit. Ind. **5**: 315 (1887).

Dentam–Pamianchi, 1500–2000 m (May 12, 1960, no. 220); Yoksam–Bakkim,

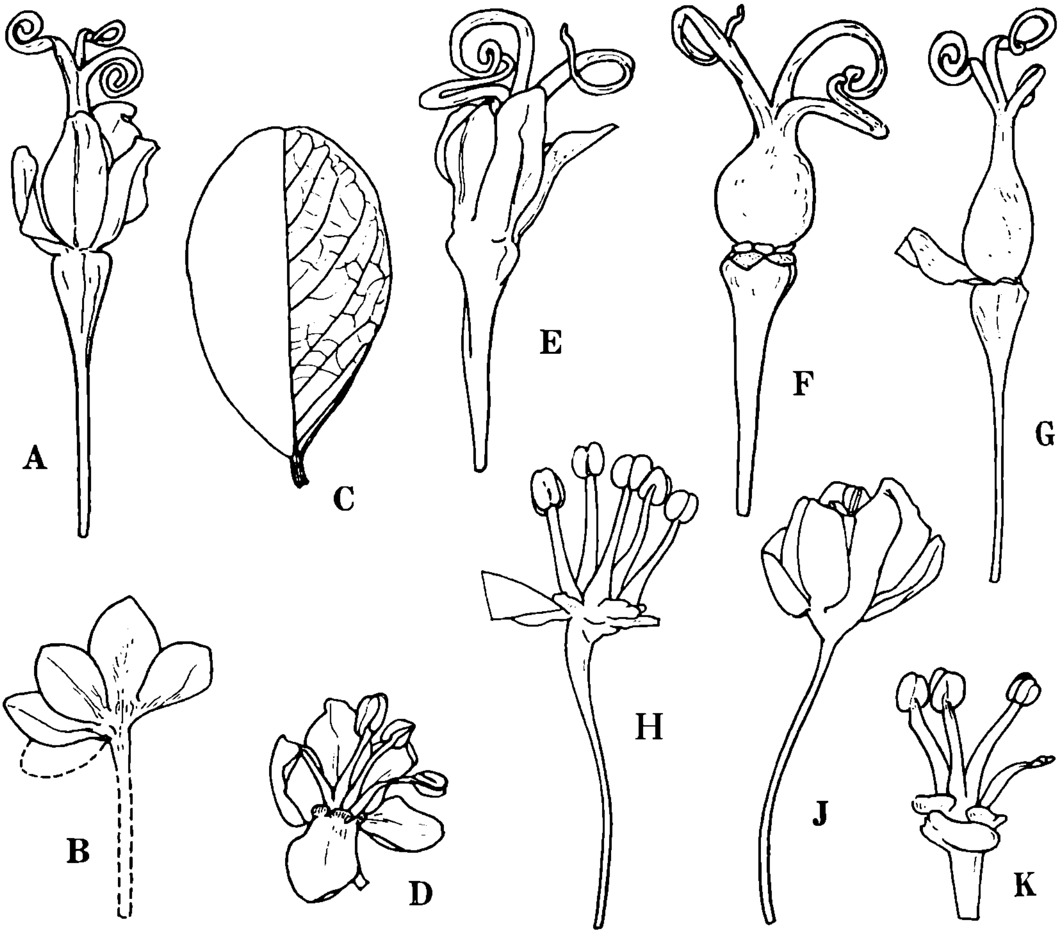

Fig. 21. *Hemicicca glauca* (Muell.-Arg.) Hurusawa et Ya. Tanaka var. *oligosperma* (Hayata) Hurusawa et Ya. Tanaka. A. Flos foemineus. B. Flos masculinus extus visus. C. Folium. D. Flos masculinus intus visus, staminibus 4 cum discis visis. E, F, G. Flores foeminei (F. et G: perianthiis amotis, discis visis). H, J, K. Flores masculini (H: perianthiis amotis, staminibus 5 et dicis visis; J: extus visus; K: perianthiis amotis, staminibus 4, inter se discis visis; stamen unicum abortivum).

1700–2000 m (May 18, 1960, no. 408); Taplethok–Helok, 1400–1500 m (Nov. 6, 1963).

Distr. E. Himalaya.

Hemicicca glauca (Muell.-Arg.) Hurusawa et Ya. Tanaka, comb. nov.

Phyllanthus glaucus Muell.-Arg. in Linnaea **32**: 14 (1863); in DC., Prodr. **15** (2): 349 (1866)–Fl. Brit. Ind. **5**: 288 (1887)–Croizat in Journ. Jap. Bot. **16** (11): 647 (1940), excl. *Ph. flex.*

P. griseus Wall. ex Hook. f., l.c. 289 (1887).

Tingling Bridge–Yoksam, 1000–1700 m (May 16, 1960, no. 294); Yoksam, 1700 m (May 17, 1960, no. 327).

Distr. sp. E. Himalaya to Central China (var. *flueggeiformis*[1]), and Formosa (var. *oligosperma*[1] [Fig. 21]).

Jatropha Curcas L., Sp. Pl. ed. 1, 1006 (1753)–Pax in Pfl.-reich IV–147, Heft. **42**: 77 (1910).

Tista, 350 m (Jun. 19, 1960); Biratnagar, 200 m (Oct. 16, 1963); Phusri–Dhara Pani, 540–900 m (Oct. 16, 1963); Bharomdin–Tharpu, 1000–1200 m (Nov. 25, 1963).

Distr. Pantropics, perhaps native to tropical America.

Kirganelia reticulata (Poiret) Baillon, Étud. Gén. Euphorb. 613, 614 (1858)–Fl. Brit. Ind. **5**: 288 (1887), sub *Phyllanth.* excl. syn. quoad *P. microcarpum*–Muell.-Arg. in DC., l.c. 345 (1866), uti a *genuina* Muell.-Arg. tantum.

Phyllanthus reticulatus Poiret, Encycl. **5**: 298 (1804).

Biratnagar, 200 m (Oct. 14, 1963); Kathgara–Rangali, 200 m (Dec. 14, 1963).

Distr. E. Himalaya, throughout tropical India, Java, Malaya, Philippines, and Africa.

Kirganelia microcarpa (Benth.) Hurusawa et Ya. Tanaka, comb. nov.

Kirganelia sinensis Baill., Étud. Gén. Euphorb. 614 (1858), nom. nud.

Cicca microcarpa Benth., Fl. Hongk. 312 (1861).

Phyllanthus microcarpus Muell.-Arg. in Linnaea **32**: 51 (1863); in DC., Prodr. **15** (2): 343 (1866).

Phyllanthus sinensis Muell.-Arg. l.c. 12 (1863).

P. reticulatus β *glaber* Muell.-Arg. in DC. l.c. 345 (1866).

Kathgara–Rangali, 200 m (Dec. 14, 1963).

Distr. E. Himalaya, Ceylon, Java, Philippines, China, and Formosa.

Macaranga indica Wight, Icon. **5**: t. 1883 (1852).

Khebang–below Siling Tzokupa, 1700–2100 m (Nov. 20, 1963).

Distr. Tropical Himalaya to South China.

Macaranga pustulata King in Hook. f., Fl. Brit. Ind. **5**: 445 (1887).

Tanarius pustulatua O. Kuntze, Rev. Gen. Pl. **2**: 619 (1891).

Takdah, 1600 m (Apr. 18, 1960, no. 2118); Dhara Pani–Dhankuta, 900–1200m (Oct. 17, 1963); Taplejung–Garhi Danra, 2000–2200 m (Nov. 3, 1963); Tuwa–Taplethok,

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[1] **Hemicicca glauca** var. **flueggeiformis** (Muell.-Arg.) Hurusawa et Ya. Tanaka, comb. nov. *Phyllanthus flueggeiformis* Muell.-Arg. in DC., l.c. 349 (1866).

Hemicicca glauca var. **oligosperma** (Hayata) Hurusawa et Ya. Tanaka, comb. nov. *Phyllanthus oligospermus* Hayata, Icon. Pl. Formos. **9**: 93 (1920), quoad pl. Formos. (specim. typ. Hayatae).

1800–1300 m (Nov. 5, 1963).

Distr. Tropical Himalaya (Kumaon to Sikkim).

Mallotus albus (Roxb.) Muell.-Arg. in Linnaea **34**: 188 (1865); in DC., Prodr. **15** (2): 965 (1866)–Fl. Brit. Ind. **5**: 429 (1887)–Pax et K. Hoffm. in Pfl.-reich IV–147–VII, Ht. **63**: 168 (1914).

Rottlera alba Roxb., Fl. Ind. ed. 2, **3**: 829 (1832).

Rangpo–Tista, 400–300 m (Jun. 18, 1960); Ranga Pani–Ghorwa, 700–300 m (Dec. 9, 1963).

Distr. Tropical Himalaya (Nepal), Assam, East Bengal, Chittagon, Ceylon, and W. China (Yunnan).

Mallotus nepalensis Muell.-Arg. in Linnaea, **34**: 188 (1865); in DC., l.c. 964 (18–66)–Fl. Brit. Ind. **5**: 428 (1877)–Pax et K. Hoffm., l.c. 165 (1914).

var. **ochraceo-albidus** Muell.-Arg. in Linnaea **34**: 188 (1865); in DC., l.c. (1866), sub *Mall. oreophilo.*–Pax et K. Hoffm. l.c. 166 (1914), sub *Mall. nepalense.*

Tista, 350 m (Jun. 20, 1960).

Distr. sp. E. Himalaya (Nepal and Sikkim) and W. China (Yunnan).

Mallotus philippinensis (Lam.) Muell.-Arg. in Linnaea **34**: 196 (1865); in DC., l.c. 980 (1866)–Pax et K. Hoffm. l.c. 184 (1914)–Hurusawa, l.c. 308 (1954).

Croton philippinensis Lam., Encycl. Méth. **2**: 209 (1786).

Biratnagar, 200 m (Oct. 16, 1963); Dhara Pani–Dhankuta, 900–1200 m (Oct. 17, 1963); Bharomdin–Tharpu, 800 m (Nov. 25, 1963); Illam–Ranga Pani, 600 m (Dec. 9, 1963); Sibganja–Mahara Bhara, 200 m (Dec. 12, 1963); Rangali–Biratnagar, 200 m (Dec. 15, 1963).

Distr. Tropical Himalaya, India, Malaya, New Guinea, E. Australia, S. China, Formosa, and Ryukyu.

Mercurialis leiocarpa Sieb. et Zucc. in Abh. Akad. Wiss. Muench. **4** (2): 145 (1845)–Pax et K. Hoffm., l.c. 280 (1914)–Hurusawa, l.c. 302 (1954), incl. pl. ex Formosa.

Khebang–Bharomdin, 1700–1000 m (Nov. 24, 1963); Batasay–Bhuspate Danra, 2400–2900 m (Dec. 1, 1963); Bhuspate Danra–below Mai Majuwa, 2900–1600 m (Dec. 3, 1963).

Distr. Central and Eastern Asia (incl. Thai, China, Formosa, Korea, Japan).

Ostodes paniculata Blume, Bijdr. 620 (1825)–Fl. Brit. Ind. **5**: 100 (1887).

Kurseong, 1550 m (Apr. 11, 1960, no. 778); Kalimpong, 1300 m (Apr. 23, 1960); Dentam–Pamianchi, 1500–2000m (May 12, 1960); Pamianchi–Gayzing Bazar, 2000–1700 m (May 13, 1960, no. 252); Ratong Chu–Yoksam, 1000–1700m (May 16, 1960); Gangtok, 1500 m (Jun. 17, 1960); Khebang–Bharomdin, 1700–1000 m (Nov. 4, 1963); Yektin–Akasay, 1400–2400 m (Nov. 30, 1963); Dhara Pani–Illam, 1500–1200 m (Dec. 5, 1963).

Distr. Tropical E. Himalaya, and Java.

Phyllanthus Emblica L., Sp. Pl. ed. 1, 982 (1753)–Muell.-Arg. in DC., Prodr. **15** (2): 352 (1866)–Hurusawa, l.c. 329 (1954).

P. Niinamii Hayata in Journ. Coll. Sci. Tokyo **20** (3): 14 (1904), pl. formos.

Dumhan, Taplejung Distr., 800 m (Oct. 31, 1963); Dumhan, by the Tamur River, 700 m (Oct. 31, 1963); Tharpu–Chyangthaphu, 1200–1100 m (Nov. 26, 1963).

Distr. Wild or planted in tropical India to China, and Formosa.

Phyllanthus Niruri L., Sp. Pl. ed. 1, 981 (1753)-Fl. Brit. Ind. **5**: 298 (1887)-Hurusawa, l.c. 329 (1954).

Nymphanthus Niruri (L.) Loureiro, Fl. Cochinch. ed. 2, 454 (1793).

Kathmandu-Thankot, 1300 m (Sep. 19, 1963); Phusri-Dhara Pani, 450-900 m (Oct. 16, 1963); Khebang, 1400 m (Nov. 23, 1963).

Distr. Pantropical and subtropical regions, except Australia.

Phyllanthus parvifolius Hamilton in D. Don, Prodr. Fl. Nepal. 63 (1825)-Fl. Brit. Ind. **5**: 294 (1887).

P. juniperinus Muell.-Arg. in Linnaea **32**: 28 (1863).

Godavari, near Kathmandu, 1500 m (Sep. 18, 1963); Kakani, 2100-2200 m (Sep. 24, 1963); Phusri-Dhara Pani, 450-900 m (Oct. 17, 1963); Dhara Pani-Dhankuta, 900-1200 m (Oct. 17, 1963); Taplejung-Garhi Danra, 2000-2200 m (Nov. 3, 1963); Ghatte, 1300 m (Nov. 17, 1963); Yamphodin-Khebang, 1700 m (Nov. 23, 1963); Khebang, 1700 m (Nov. 23, 1963); Khebang-Bharomdin, 1700-1000 m (Nov. 24, 1963); Ranga Pani-Ghorwa, 700-300 m (Dec. 9, 1963).

Distr. Eastern Himalaya to W. China (Yunnan).

Phyllanthus simplex Retzius, Obs. **5**: 29(1789)-Willd., Sp. Pl. **4**: 573 (1805)-Roxb., Fl. Ind. ed. 2, **3**: 654 (1832)-Fl. Brit. Ind. **5**: 295 (1887).

Biratnagar, 200 m (Oct. 14, 1963); Mahara Bahara-Kathgara, 200 m (Dec. 13, 1963).

Distr. Tropical and subtropical Asia (east to Ryukyu).

Phyllanthus Urinaria L., Sp. Pl. ed. 1, 982 (1753)-Fl. Brit. Ind. **5**: 293 (1887)-Hurusawa, l.c. 329 (1954).

Biratnagar, 200 m (Oct. 14, 1963); Dhankuta, 1200 m (Oct. 30, 1963); Nissim-Dumhan, 1500-700 m (Oct. 30, 1963); Dumhan, by the Tamur River, 700 m (Oct. 31 & Nov. 1, 1963); Khebang, 1400 m (Nov. 23, 1963); Bharomdin-Tharpu, 1000-1200 m (Nov. 25, 1963); Chyangthaphu-Birwa, 1100-2400 m (Nov. 27, 1963).

Distr. Tropical and subtropical Asia, and Africa.

Poinsettia geniculata (Ortega) Small, Man. Fl. Southeast. U.S. 803 (1933).

Euphorbia geniculata Ortega (Hort. Matr. Decad. 18) ex Boiss. in DC., Prodr. **15** (2): 72 (1866).

Kathmandu, 1400m (Oct. 13, 1963); Dhara Pani—Dhankuta, 300-1200m (Oct. 17, 1963); Tharpu, 1200 m (Nov. 26, 1963).

Distr. Origin of tropical America, and wild in tropical regions.

Poinsettia pulcherrima Graham in Edinb. New Philos. Journ. **20**: 412 (1836)-Bot. Mag. t. 3493 (1836).

Dhara Pani-Dhankuta, 900-1200 m (Oct. 17, 1963); below Siling Tzokupa-Khebang, 2100-1700 m (Nov. 22, 1963); Bharomdin-Tharpu, 1000-1200 m (Nov. 25, 1963).

Distr. Probably native to Central America, but now abundantly cultivated in tropical regions.

Ricinus communis L., Sp. Pl. ed. 1, 1007 (1753).

Tuwa-Taplethok, 1800-1500 m (Nov. 5, 1963).

Distr. Native of Africa, and widely cultivated in tropical and subtropical regions, and also in Japan.

Sauropus androgynus (L.) Merrill in For. Bur. Philip. 30 (1903); in Philip. Journ. Sci. **4**: 72 (1909).

Cluytia androgyna L., Mant. Pl. **1**: 128 (1767).

Sauropus albicans Blume, Bijdr. 596 (1825)–Fl. Brit. Ind. **5**: 332 (1887).

S. indicus Wight, Icon. **6**: t. 1952 (1853)–Miquel, Fl. Ind. Batav. **1**: 2 (1859).

Phusri–Dhara Pani, 450–900 m (Oct. 16, 1963).

Distr. Himalaya, Java and Philippines.

Sauropus compressus Muell.-Arg. in DC., Prodr. **15** (2): 243 (1866)–Fl. Brit. Ind. **5**: 336 (1887).

Illam–Ranga Pani, 1200–700 m (Dec. 8, 1963).

Distr. Tropical E. Himalaya.

Sauropus pubescens Hook. f., Fl. Brit. Ind. **5**: 335 (1887)–Pax et K. Hoffm. in Pfl.-reich IV–147–XV, Ht. **81**: 225 (1922).

S. quadrangularis var. *pubescens* Kurz, For. Fl. **2**: 530 (1877), fide Pax.

Aalius pubescens O. Kuntze, Rev. Gen. Pl. 591 (1891).

Rangpo–Tista, 350 m (Jun. 18, 1960).

Distr. Tropical E. Himalaya and Burma.

Securinega suffruticosa (Pall.) Rehder in Journ. Arn. Arb. **13**: 338 (1932)–Hurusawa in Journ. Fac. Sci. Univ. Tokyo Bot. **6**: 329 (1954).

Pharnaceus suffruticosum Pallas, Reise Russ. Reich **3**: 716 (1776); Voyage Russ. Asia septentr. **4**, 614 (le phaenaceum sous arbrisseau) et sub nota; Append. 687, no. 70 et **6**, pl. 22, f. 2 (1793).

Geblera suffrutiocosa Fisch. et Mey., Ind. Sem. Hort. Petrop. **1**: 28 (1835).

Fluggea suffruticosa Baill., Étud. Gén. Euphorb. 592 (1859).

Securinega ramiflora Muell.-Arg. in DC., l.c. 449 (1866), cum syn. *Xylophylla ramiflora* Aiton, Hort. Kew. 376 (1789).

Rayang, 250 m (Apr. 21, 1960, no. 1820).

Distr. sp. Himalaya to China, Korea, and Japan (var. *japonica* Miquel).

Tithymalus himalayensis (Klotzsch) Hurusawa et Ya. Tanaka, comb. nov.

Euphorbia himalayensis Klotzsch, Bot. Ergeb. Waldem. Reise 115, t. 20 (1862)–Boiss. in DC., Prodr. **15** (2): 113 (1866)–Fl. Brit. Ind. **5**: 258 (1887).

Phalut, 3500 m (May 9, & Jun. 4 & 5, 1960); Migothang, 3900 m (Jun. 1, 1960); Migothang–Nayathang, 3900–3300 m (Jun. 1, 1960, no. 727); Chia Bhanjang–Phalut, 3100–3500 m (Jun. 2, 1960); Nayathang–Chia Bhanjang, 3300–3100 m (Jun. 2, 1960).

Distr. E. Himalaya.

Tithymalus pseudosikkimensis Hurusawa et Ya. Tanaka, sp. nov. [Fig. 22]

Tithymalo sikkimense habitu affinis, differt autem ovario juniore non piloso sed glabrato et subverrucoso. Ex *Tithymalo longifolio*[1] differt foliorum basi subpetiolata, capsula matura non conico-verrucosa et caule totius glabra.

Herbacea tota glabra, caulis erectis, superne ramosis, radiis 5–6, 2–3 fidis deinde bifidis. Folia caulina firmula saliciformia et subpetiolata ovato-rhomboidea xanthina. Involucra 3 mm diam. campanulata extus glabra intus hirta, lobis ovatis margine ciliatis, glandulis hemisphaerico-oblongis, bracteolis interfloralibus masculinis latis vel subulatis molliter albo-villosis. Ovarium depresso-globosum, obscuro et minute tuberculatum, totius glabrescens. Styli 3 mm longi tripartiti basi ad

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1) **Tithymalus longifolius** (D. Don) Hurusawa et Ya. Tanaka, comb. nov.
Euphorbia longifolia D. Don, Prodr. Fl. Nepal. 62 (1825).

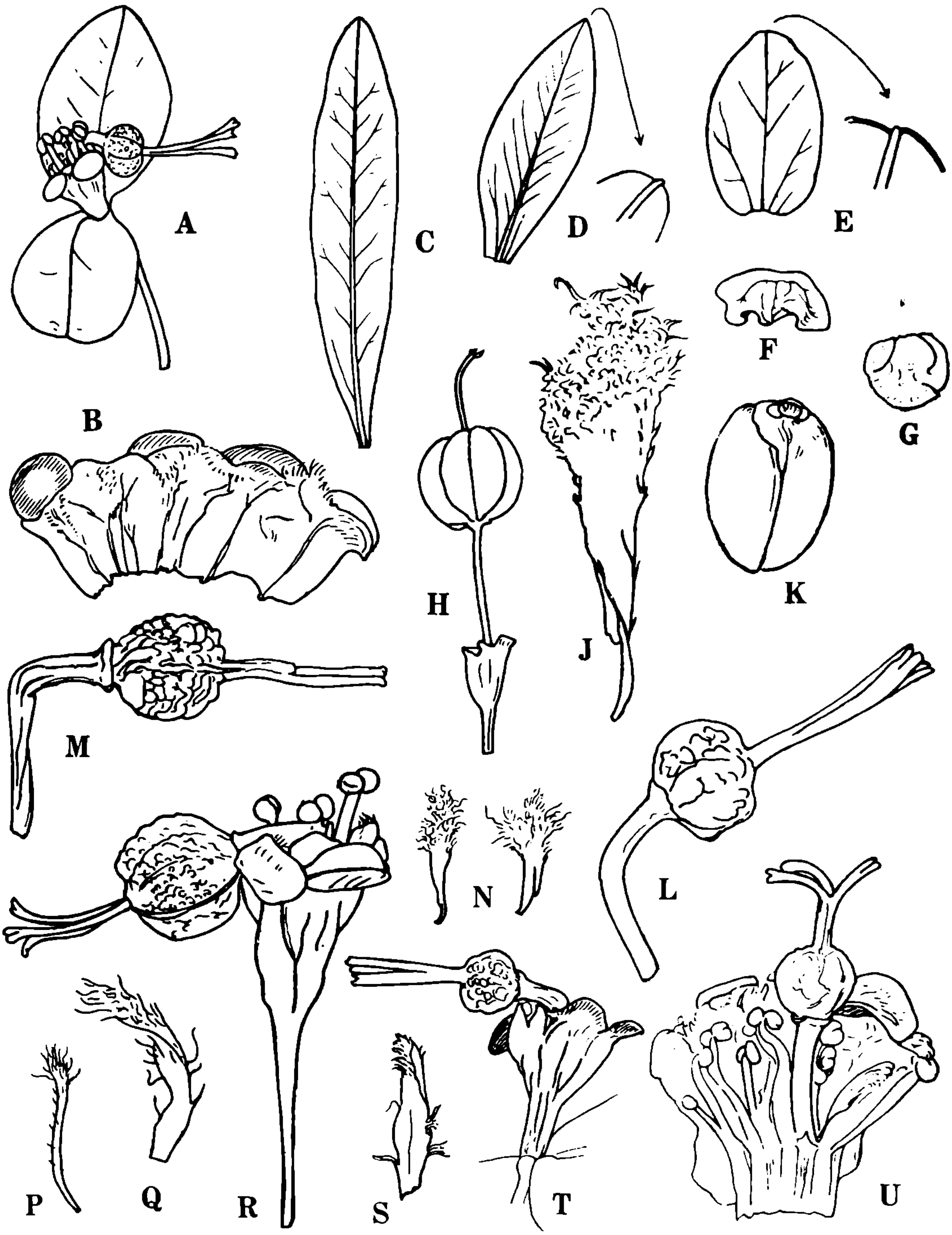

Fig. 22. *Tithymalus pseudosikkimensis* Hurusawa et Ya. Tanaka. A. Cyathium cum foliis floralibus. B. Involucrum apertum. C. Folium caulinum. D. Folium umbellarium. E. Folium floralium. F. Glandula intus visa. G. Glandula extus supra visa. H. Capsula matura ex involucro exserta. J. Bracteola inter flores masculinos valde magnificata. K. Semen ventrale visum, caruncula visa. L, M. Capsula vel matura vel submatura. N, P, x, S. Bracteolae diversae. R, T. Cyathium vel sub anthesin vel ante anthesin. U. Cyathium apertum intus visum, floribus masculinis et flore foemineo.

1/2–1/3 connati, apice breviter bifidi. Capsulae 4 mm diam. globoso-depressae sub-verrucosae.

Above Lelep, 2600 m (Nov. 9, 1963—Typus in TI); Baroya Khimty, 2500 m (Nov. 10, 11, & 15, 1963); Illandanda–Helok, 1800–1500 m (Nov. 13, 1963); below Siling Tzokupa, 2100 m (Nov. 21, 1963).

Tithymalus sikkimensis (Boiss.) Hurusawa et Ya. Tanaka, comb. nov.

Euphorbia sikkimensis Boiss. in DC., Prodr. **15** (2): 113 (1866)–Fl. Brit. Ind. **5**: 259 (1887).

Darjeeling Botanic Garden, cult. (Jun. 25, 1960).

Distr. E. Himalaya.

Tithymalus Stracheyi (Boiss.) Hurusawa et Ya. Tanaka, comb. nov.

Euphorbia Stracheyi Boiss. in DC., Prodr. **15** (2): 114 (1866)–Fl. Brit. Ind. **5**: 259 (1887).

Jongri, 4000–4200 m (May 2, 1960); north of Jongri, 4000–4500 m (May 25, 1960); Jongri–Olothang, 4000–3900 m (May 23, 1960).

Distr. Himalaya (Garhwal to Bhutan), and W. China.

DAPHNIPHYLLACEAE (by Isao Hurusawa & Yasuyoshi Tanaka)

Daphniphyllum himalayense Muell.-Arg. in DC., Prodr. **16** (1): 113 (1869), p.p.–Fl. Brit. Ind. **5**: 354 (1887), p.p.

Palmajua–Rimbick, 2300–2200 m (May 5, 1960, no. 114); Sandakphu–Garibans, 3500–2800 m (Jun. 7, 1960, no. 689); Bhuspate Danra, 2800m (Dec. 2, 1963); Bhandukay Bhanjang, 3100 m (Dec. 3, 1963, fr.).

Distr. Himalaya, and W. China (Yunnan).

CALLITRICHACEAE (by Hiroshi Hara)

Callitriche stagnalis Scopoli, Fl. Carn. ed. 2, **2**: 251 (1772)–Fl. Brit. Ind. **2**: 434 (1878)–Glück, Süssw.-Fl. Mitt.-Eur. **15**: 293, fig. (1936)–Fassett in Rhodora **53**: 211, f. 23 (1951). [Fig. 23]

C. Wightiana Wall. ex Wight et Arnott, Prodr. 339 (1834)–Wight, Icon. **6**: t. 1947 (1853).

Dentam, 1400 m (May 11, 1960); Yoksam, 1700 m (May 16, 1960, no. 303, fl.); Senchal, 2450 m (Jun. 23, 1960); above Tutay, 2700 m (Oct. 26, 1963, fl. & fr.); Minchin Dhap–Mul Pokhari, 2900–2500 m (Oct. 29, 1963, fr.); Gorzu Kosir–Nissim, 1800 m (Oct. 30, 1963, fr.).

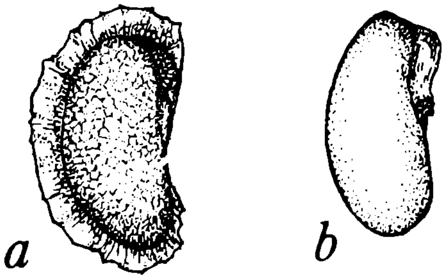

Fig. 23. *Callitriche stagnalis* Scopoli, collected between Minchin Dhap and Mul Pokhari (Oct. 29, 1963). a. Mericarp, ×15. b. Seed, ×15.

Distr. Europe, N. Africa, C. Asia, India, W. China, Australia, and N. America. Our specimens are nearest to *C. stagnalis* Scopoli, and those from Minchin Dhap-Mul Pokhari and Yoksam correspond to f. *terrestris* Glück (var. *serpyllifolia* Lönnr.). As compared with *C. stagnalis*, however, the fruits are broader, and 1.7–2 mm across (broader than long), the wing is equally broad all around, and often erose on the margin, the reticulations of pericarp are coarser, consisted of less thickened walls, and the seeds are winged above the hilum (Fig. 23). If these characters are proved to be constant in all Himalayan material, the plants can be regarded as an independent species.

BUXACEAE (by Hiroshi Hara)

Sarcococca coriacea (Hook.) Sweet, Hort. Brit. ed. 1, 491 (1827); ed. 2, 456 (1830)–Stapf in Bot. Mag. sub t. 9045 in adnota (1925)–Sealy in Hook., Icon. Pl. sub t. 3469 (1947).

Pachysandra? coriacea Hook., Exot. Fl. **2**: t. 148 (1825).

Sarcococca pruniformis Lindley in Bot. Reg. **12**: t. 1012 (1826), *α. latifolia* Lindley–Fl. Brit. Ind. **5**: 266 (1887), p.p.

S. saligna α. coriacea (Hook.) Muell.-Arg. in DC., Prodr. **16** (1): 11 (1869).

S. saligna γ. latifolia (Lindl.) Muell.-Arg., l.c. 12 (1869), p.p.

Sunderijal Waterfall, Kathmandu, 1600 m (Sep. 20, 1963, fl., fr.); Kathmandu Air Port, 1400 m (Oct. 13, 1963, fl., fr.); Phusri–Dhara Pani, 900–1200 m (Oct. 16, 1963); Tharpu–Chyangthaphu, 1200–1300m (Nov. 26, 1963, fr.); Yektin, 1100m (Nov. 29, 1963, fr.); Yektin–Akasay, 1100–2000 m (Nov. 30, 1963, fr.).

Distr. E. Himalaya (Nepal and eastwards), Khasia, Naga Hills, and Manipur.

Sarcococca Hookeriana Baillon, Monogr. Bux. 53 (1859)–Sealy in Hook., Icon. Pl. t. 3470 (1947)–Rehder, Bibl. 389 (1949).

S. pruniformis var. *Hookeriana* (Baill.) Hook. f., Fl. Brit. Ind. **5**: 267 (1887).

Chia Bhanjang–Dentam, 2000m (May 11, 1960, no. 233, fl.); Garibans–Tonglu, 2800–3000 m (Jun. 7, 1960, fl.); above Tutay, 2600 m (Oct. 26, 1963, fr.); Baibatay Bhanjang–Hati Sar, 2200–2900 m (Oct. 27, 1963, fr.); Hati Sar–Minchin Dhap, 2800–2900 m (Oct. 28, 1963, fr.); Minchin Dhap–Mul Pokhari, 2900–2500 m (Oct. 29, 1963, fr.); Baroya Khimty, 2500m (Nov. 11, 1963); Baroya Khimty–Thakma Khola, 2500–3200 m (Nov. 16, 1963, fr.); Halhale Bhanjang–Bhuspate Danra, 2700–2900 m (Dec. 1, 1963, fr.); Bhuspate Danra, 2900 m (Dec. 2, 1963, fr.).

Distr. E. Himalaya (E. Nepal to Bhutan), N. Assam, and S. Tibet.

Sarcococca Wallichii Stapf in Kew Bull. **1916**: 37 (1916)–Sealy in Hook., Icon. Pl. t. 3469 (1947).

S. pruniformis Lindl. sensu Hook. f., Fl. Brit. Ind. **5**: 266 (1887), p.p.

Batasi, 2000 m (May 2, 1960, fl.); Palmajua–Rimbick, 2300–2200 m (May 5, 1960, fr.); Rimbick, 2200 m (May 6, 1960, fl.); Sinduwa, 2100 m (Oct. 24, 1963, fl.); above Tutay, 2500 m (Oct. 26, 1963, fl., fr.); Hati Sar–Minchin Dhap, 2700–2900 m (Oct. 28, 1963, fl.); Mul Pokhari–Gorzu Kosir, 2500–2100 m (Oct. 30, 1963, fr.); Halhale Bhanjang, 2800 m (Dec. 1, 1963, fl., fr.).

Distr. E. Himalaya (Nepal, Sikkim), and W. China (Yunnan).

CORIARIACEAE (by Hiroshi Hara)

Coriaria terminalis Hemsley in Hook., Icon. Pl. **23**: t. 2220 (1892)–Bot. Mag.

t. 8525 (1913).

Zongi–Walunchung Gola, 3100 m (Nov. 10 & 11, 1963, fr.).

Distr. sp. E. Himalaya (E. Nepal, Sikkim), S. Tibet, and W. China.

The fruits are rather dry and yellowish brown, and the plant can be referred to var. *xanthocarpa* Rehder et Wilson in Pl. Wilson. **2**: 171 (1914).

ANACARDIACEAE (by Hiroo Kanai)

Choerospondias axillaris (Roxb.) B. L. Burtt et A. W. Hill in Ann. Bot. n.s. **1**: 254 (1937); in Kew Bull. **1937**: 407 (1937)–Hara, Enum. Sperm. Jap. **3**: 64 (1954).

Spondias axillaris Roxb. [Hort. Beng. 34 (1814), nom. nud.] Fl. Ind. ed. 2, **2**: 453 (1832)–Fl. Brit. Ind. **2**: 42 (1876).

Helok, 1500 m (Nov. 6, 1963, fr.).

Distr. E. Himalaya, Assam, Burma, Thai, S. & C. China, and S. Japan.

Dobinea vulgaris Hamilt. ex D. Don, Prodr. Fl. Nepal. 249 (1825)–Fl. Brit. Ind. **1**: 696 (1875).

Nissim, 1400 m (Oct. 30, 1963); Taplethok–Helok, 1500 m (Nov. 6, 1963); Ghatte, 1300 m (Nov. 17, 1963); Ghatte–Khebang, 1600 m (Nov. 19, 1963); Khebang–Siling Tzokupa, 1600 m (Nov. 20, 1963); Mai Majuwa–Mai Pokhari, 1500 m (Dec. 4, 1963).

Distr. E. Himalaya, and Burma?

Odina Wodier Roxb., Fl. Ind. ed. 2, **2**: 293 (1832)–Fl. Brit. Ind. **2**: 29 (1876).

Mahara Bahara–Gauriganja, 300 m (Dec. 13, 1963).

Distr. India, Burma, Ceylon, and Andaman.

Rhus insignis Hook. f. in Fl. Brit. Ind. **2**: 11 (1876)–Basu, Ind. Med. Pl. 371, t. 271 (1918).

Heydewa, 1900m (Nov. 3, 1963); Garhi Danra–Linkhim, 1600m (Nov. 4, 1963); Iladanda–Selap, 2000 m (Nov. 9, 1963).

Distr. Temp. Himalaya.

Rhus javanica L., Sp. Pl. ed. 1, **1**: 265 (1753)–Hara, Enum. Sperm. Jap. **3**: 65 (1954).

R. chinense Miller, Gard. Dict. ed. 8, RHU (1768)–Kitamura, Faun. & Fl. Nepal Himal. 173 (1955).

R. semialata Murray in Comm. Soc. Sci. Goetting. **6**: 27, t. 3 (1784)–Fl. Brit. Ind. **2**: 10 (1876).

Palmajua–Rimbick, 2000 m (May 5, 1960); Balaju Water Garden, Kathmandu, 1300 (Sep. 23, 1963); Dhara Pani, Dhankuta Distr., 1000 m (Oct. 17, 1963); Dumhan–Taplejung, 1200 m (Nov. 1, 1963); Garhi Danra–Linkhim, 1800 m (Nov. 4, 1963); Iladanda–Selap, 2000 m (Nov. 9, 1963); Khebang, 1700 m (Nov. 20, 1963).

Distr. Himalaya, Assam, Burma, Thai, Indo-China, China, Formosa, Korea, and Japan.

Rhus succedanea L., Mant. Pl. **2**: 221 (1771)–Fl. Brit. Ind. **2**: 12 (1876)–Hara, Enum. Sperm. Jap. **3**: 65 (1954)–Kitamura, Faun. & Fl. Nepal Himal. 173 (1955).

Rimbick–Ramam, 2100 m (May 7, 1960); Dentam–Pamianchi, 2000 m (May 12, 1960); Yoksam–Bakkim, 1800 m (May 18, 1960); Sinduwa, Dhankuta, 2100 m (Oct. 24, 1963).

Distr. Himalaya, Burma, Thai, Indo-China, China, and Japan.

In the fruiting specimens from Nepal, the drupe is depressed ellipsoid and has smooth pericarp with stout pedicel, and is referrable to var. *sphaerocarpa* Hook. f., Fl. Brit. Ind. **2**: 12 (1876), while that of Japan and China is obliquely globose and laterally compressed with slender pedicel and has wrinkled pericarp..

Other flowering specimens from Sikkim have pubsecent panicles, leaves crowded at the end of the branches, and leaflets 2–3 pairs with 20–25 pairs of nerves. The flowers are indistinguishable from those of the Japanese plants.

Rhus Wallichii Hook. f., Fl. Brit. Ind. **2**: 11 (1876)–Basu, Ind. Med. Pl. 370, t. 270 (1918).

Heydewa, 1900 m (Nov. 3, 1963); Garhi Danra–Linkhim, 1600m (Nov. 4, 1963); Iladanda–Selap, 2000 m (Nov. 9, 1963).

Distr. Temperate Himalaya.

Semecarpus Anacardium L. f., Suppl. Pl. 182 (1781)–Fl. Brit. Ind. **2**: 30 (1876)–Basu, Ind. Med. Pl. 384, t. 279 (1918).

Loohya Mai–Ghorwa, 300 m (Dec. 9, 1963); Sibganja–Mahara Bahara, 300 m (Dec. 12, 1963).

Distr. India, Burma, and Australia.

AQUIFOLIACEAE (by Hiroshi Hara)

Ilex crenata Thunberg, Fl. Jap. 78 (1784)–Hara, Enum. Sperm. Jap. **3**: 69 (1954).

var. **Thomsoni** (Hook. f.) Loesener, Monogr. Aquifol. **1**: 202, t. 4, f. 2 c (1901), ut *Thomsonii*; in Mitt. Deuts. Dendr. Ges. **1919**: 16 (1919).

I. Thomsoni Hook. f., Fl. Brit. Ind. **1**: 602 (1875)–Kanjilal, Fl. Assam **1** (2) : 260 (1937)–S.-Y. Hu in Journ. Arn. Arb. **30**: 318 (1949), in nota.

Rimbick–Ramam, 1900–2400 m (May 7, 1960, bud).

Distr. E. Himalaya (Sikkim, Bhutan), and Khasia.

The relationship between the Himalayan plants and typical *I. crenata* of Japan needs further critical studies based on ample material.

Ilex dipyrena Wallich in Roxburgh, Fl. Ind. ed. Carey, **1**: 473 (1820)–Wall., Pl. Rar. Asia. **3**: 68, t. 292 (1832)–Fl. Brit. Ind. **1**: 599 (1875)–Loesener, Monogr. Aquifol. **1**: 276 (1901); in Mitt. Deuts. Dendr. Ges. **1919**: 40 (1919); in Engl., Pfl.-fam. ed. 2, **20 b**: 68 (1942)–S.-Y. Hu in Journ. Arn. Arb. **30**: 358 (1949); in Journ. Amer. Hort. Soc. **36**: 53, f. 14. 22 (1957).

Bakkim–Jongri, 2500–4000 m (May 19, 1960, no. 378 & no. 616, fr.); Minchin Dhap–Mul Pokhari, 2900–2500 m (Oct. 29, 1963); Walunchung Gola–Zongi, 3800–2800 m (Nov. 11, 1963); Halhale Bhanjang, 2700 m (Dec. 1, 1963); Tendong Peak, 2890 m (May 26, 1963, fr.).

Distr. Himalaya (Punjab to NEFA), Manipur, N. Burma, and W. China.

Ilex fragilis Hooker f., Fl. Brit. Ind. **1**: 602 (1875)–Loesener, l.c. 492 (1901), l.c. 59, f. 4 E–H (1919); l.c. 79, f. 19 E–H (1942)–S.-Y. Hu, l.c. 259 (1949); l.c. 59 (1957).

Batasi–Palmajua, 2300–2600 m (May 3, 1960, no. 77, bud); Bakkim, 2500 m (May 18, 1960, no. 417; May 19, 1960, no. 421 & 618, fl.); Garibans–Tonglu, 2800–3000 m (Jun. 7, 1960, fl.); Senchal–Tiger Hill, 2400–2500 m (Jun. 23, 1960, fl.); Bilbatay

Bhanjang–Hati Sar, 2200–2900 m (Oct. 27, 1963, fr.).

Distr. E. Himalaya (Nepal to Bhutan), Khasia, S. Tibet, N. Burma, and W. China.

The specimens from Tonglu and Tinjuray have leaves minutely pubescent on nerves beneath, and belong to f. *Kingii* Loesener.

Ilex insignis Hooker f., Fl. Brit. Ind. **1**: 599 (1875)–Loesener, l.c. 282, t. 8, f. 2 (1901); l.c. 44 (1919); l.c. 68 (1942).

Batasi, 2000 m (May 2, 1960, no. 13, fr.); Mai Majuwa–Dhara Pani, 1600–1500 m (Dec. 4, 1963); Darjeeling, 2150 m (Mar. 14, 1963, fr.).

Distr. E. Himalaya (Nepal, Sikkim), and W. China (Yunnan).

Ilex intricata Hooker f., Fl. Brit. Ind. **1**: 602 (1875)–Loesener, l.c. 418 (1901); l.c. 49, t. 3 A–D (1919); l.c. 74, f. 18 A–D (1942)–S.-Y. Hu in Journ. Arn. Arb. **31**: 49 (1950); l.c. 55, f. 17. 18 (1957).

Phalut–Chia Bhanjang, 3300m (May 11, 1960, no. 199; Jun. 2, 1960, no. 776, fl.); Bakkim–Jongri, 2500–4000 m (May 19, 1960, no. 364 & 377, fl.); Diorali–Bhanjang, 3200–3500 m (Nov. 17, 1963, bud); Siling Tzokupa, 2800 m (Nov. 21, 1963, fr.).

Distr. E. Himalaya (Nepal, Sikkim), S. Tibet, and W. China (Yunnan).

Ilex sikkimensis Kurz in Journ. Asia. Soc. Beng. **44**: 202 (1875)–King in Journ. Asia. Soc. Beng. **55**: 265, t. 13 (1886)–Loesener, l.c. 286 (1901); l.c. 44 (1919); l.c. 69 (1942).

I. odorata Hamilt. sensu Hook. f., Fl. Brit. Ind. **1**: 599 (1875), p.p.

I. Hookeri King, l.c. 266, t. 14 (1886)–Loesen., l.c. 287 (1901); l.c. 45 (1909).

Phalut–Chia Bhanjang, 3100m (May 11, 1960, no. 173, fl.); Sandakphu–Gatribas, 2800–3000 m (Jun. 7, 1960, fr.); Bilbatay Bhanjang–Hati Sar, 2200–2900 m (Oct. 27, 1963); Baroya Khimty–Thakma Khola, 2500–3200 m (Nov. 12 & 17, 1963); below Siling Tzokupa, 2800 m (Nov. 21, 1963, fr., bud).

Distr. E. Himalaya (Nepal to Bhutan), S. Tibet, Manipur, and W. China?

Ilex umbellulata (Wall.) Loesener, Monogr. Aquifol. **1**: 99 (1901); in Engl., Pfl.-fam. ed. 2, **20 b**: 57 (1942)–S.-Y. Hu in Journ. Arn. Arb. **30**: 315 (1949); l.c. 45. f. 11. 12 (1957).

Ehretia umbellulata Wall. in Roxb., Fl. Ind. ed. Carey, **2**: 344 (1824).

Ilex sulcata Wall. ex Hook. f., Fl. Brit. Ind. **1**: 604 (1875).

Near Taplethok, 1400 m (Nov. 5, 1963, fr.).

Distr. E. Himalaya (Nepal), Bengal, Assam, Burma, Indo-China, and W. China (Yunnan).

CELASTRACEAE (including Hippocrateaceae)

(by Hiroshi Hara)

Cassine glauca (Rottb.) O. Kuntze, Rev. Gen. Pl. **1**: 114 (1891)–Fl. Males. **6**: 286 (1962).

Mangifera glauca Rottb., Nye Sam. Vid. Selsk. Skrift. **2**: 534, t. 4, f. 1 (1783).

Celastrus glaucus Vahl, Symb. Bot. **2**: 42 (1791).

Elaeodendrum glaucum (Vahl) Persoon, Syn. **1**: 241 (1805)–Fl. Brit. Ind. **1**: 623 (1875).

Dumhan, 800 m (Oct. 31, 1963); Ranga Pani–Sanichare, 200 m (Dec. 9, 1963, fr.).

Distr. Tropical Himalaya, India, and Ceylon.

Celastrus Hookeri Prain in Journ. Asia. Soc. Beng. **73**: 197 (1904)–Ding Hou in Ann. Miss. Bot. Gard. **42**: 254 (1955).

Palmajua-Rimbick, 1500-2200 m (May 5, 1960, no. 159, fl.).

Distr. E. Himalaya (Sikkim), Khasia, Manipur, N. Burma, Indo-China, and W. China (Yunnan).

Celastrus paniculatus Willdenow, Sp. Pl. **1**: 1125 (1797), ut *paniculata*–Fl. Brit. Ind. **1**: 617 (1875)–Hou, l.c. 229, f. 3 (1955); in Fl. Males. **6**: 235 (1962).

Tamur Bridge–Dhankuta, 600 m (Oct. 17, 1963, fr.).

subsp. **multiflorus** (Roxb.) Ding Hou, l.c. 231 (1955).

C. multiflorus Roxb., Fl. Ind. ed. Carey, **2**: 389 (1824).

Ranga Pani–Ghorwa, 700–300 m (Dec. 9, 1963, fr.).

Distr. sp. India, Ceylon, Burma, Thai, Indo-China, Malaysia, Australia, New Caledonia, China, and Formosa.

The specimen from above Tamur Bridge has obovate-orbicular leaves which are subtruncate and cuspidate at the apex, and minutely pubescent, and is referrable to var. *pubescens* Kurz. The other specimen collected below Range Pani has elliptic and glabrous leaves, and belongs to subsp. *multiflorus* (Roxb.) Ding Hou.

Celastrus stylosus Wallich in Roxburgh, Fl. Ind. ed. Carey, **2**: 401 (1824)–Fl. Brit. Ind. **1**: 618 (1875), p.p.–Hou, l.c. 272, f. 12 (1955); l.c. 237 (1962).

Takdah, 1700 m (Apr. 19, 1960, no. 2171, fl.); Baroya Khimty, 2600 m (Nov. 10, 11 & 15, 1963, fr.); Akasay, 2100 m (Nov. 30, 1963, fr.).

Distr. E. Himalaya (Nepal, Sikkim), Khasia, Java, and Lesser Sunda Is.

Euonymus echinatus Wallich in Roxburgh, Fl. Ind. ed. Carey, **2**: 410 (1824)–Royle, Ill. Bot. Himal. t. 31, 1 (1839)–Fl. Brit. Ind. **1**: 611 (1875), p.p.–Sprague in Kew Bull. **1908**: 32 (1908)–Blakelock in Kew Bull. **1951**: 274 (1951).

Sandakphu–Garibans, 3500–2800 m (Jun. 7, 1960, defl.); Yoksam–Bakkim, 1700–2200 m (May 18, 1960, fl.).

Distr. Himalaya (Kashmir to Sikkim).

Euonymus frigidus Wallich in Roxburgh, Fl. Ind. ed. Carey, **2**: 409 (1824)–Fl. Brit. Ind. **1**: 611 (1875)–Blakelock in Kew Bull. **1948**: 238, fig. E (1948), var. *typicus*; **1951**: 282 (1951); in Bot. Mag. n. s. t. 161 (1951). [Pl. 3 c]

Batasi–Palmajua, 2300–2600 m (May 3, 1960, no. 65, fl.); Palmajua–Rimbick, 2300–1500m (May 5, 1960, fl.); Chia Bhanjang–Dentam, 3100–2000m (May 11, 1960, no. 186, fl.); Garibans–Tonglu, 2800–3000 m (Jun. 7, 1960, fl.); Bilbatay Bhanjang–Hati Sar, 2700 m (Oct. 27, 1963, fr.); Lam Pokhari, 2800 m (Oct. 28, 1963, fr.); Minchin Dhap–Mul Pokhari, 2900–2700 m (Oct. 29, 1963, fr.); Baroya Khimty–Thakma Khola, 2700–3000 m (Nov. 12 & 16, 1963, fr.); Bhuspate Danra, 2900 m (Dec. 2, 1963, fr.).

f. **elongatus** (Cowan et Cowan) Hara, comb. nov.

E. frigidus var. *elongatus* Cowan et Cowan, Tr. N. Bengal 35 (1929)–Blakelock, l.c. 238 (1948).

E. frigidus var. 2. *elongata* King in Fl. Assam **1** (2): 265 (1936).

Batasi–Palmajua, 2300–2600 m (May 3, 1960, no. 66, fl.); Migothang–Nayathang, 3900–3300 m (Jun. 1, 1960, fl.); Nayathang–Phalut, 3200 m (Jun. 2, 1960, no. 750, fl.); Sandakphu–Garibans, 3500–2800 m (Jun. 7, 1960, fl.); Diorali Bhanjang–Bandukay, 2900–3200 m (Nov. 14 & 17, 1963, fr.); Chyangthaphu–Birwa, 1300–2400 m (Nov. 27, 1963, fr.).

Distr. sp. E. Himalaya (Nepal to Bhutan), Assam, Manipur, N. Burma, and W. China (Yunnan).

Euonymus grandiflorus Wallich in Roxburgh, Fl. Ind. ed. Carey, **2**: 404 (1824)-Wallich, Tent. Fl. Napal. 41, t. 30 (1826); Pl. Asia. Rar. **3**: t. 254 (1832)-Fl. Brit. Ind. **1**: 608 (1875)-Blakelock, l.c. 261 (1951).

Darjeeling, 2100 m (Jun. 22, 1960, young fr.).

Distr. Himalaya (Kumaon to Bhutan), Khasia, N. Burma, and W. & C. China.

Euonymus Hamiltonianus Wallich in Roxburgh, Fl. Ind. ed. Carey, **2**: 403 (1824)-Fl. Brit. Ind. **1**: 612 (1875)-Blakelock, l.c. 246 (1951), p.p.

Gangtok, 1750 m (Jun. 16, 1960, fl.); Kathmandu–Thankot, 1500 m (Sep. 20, 1963, fr.); Tharpu–Chyangthaphu, 1200–1300m (Nov. 26, 1963, fr.); Khunga, 2000m (Nov. 27 & 28, 1963, fr.).

Distr. Himalaya (Kashmir to Bhutan), Khasia, Manipur, and N. Burma.

As regards the relation to the Japanese plants, see page 639.

Euonymus tingens Wallich in Roxburgh, Fl. Ind. ed. Carey, **2**: 406 (1824)-Fl. Brit. Ind. **1**: 610 (1875)-Blakelock, l.c. 252 (1951).

Ramam–Phalut, 2400–3500 m (May 9, 1960, no. 164, fl.); Bhandukay Bhanjang, 3100 m (Dec. 3, 1963, fr.).

Distr. Himalaya (Simla to Sikkim), N. Burma, and W. China (Yunnan, Szechuan).

Euonymus vagans Wallich in Roxburgh, Fl. Ind. ed. Carey, **2**: 412 (1824)-Fl. Brit. Ind. **1**: 611 (1875)-Blakelock, l.c. 267 (1951).

Ghum, 2300 m (Apr. 4, 1960, bud); Batasi–Palmajua, 2300–2600 m (May 3, 1960, no. 63, fl.); Darjeeling, 2200 m (Dec. 26, 1963, fr.); Sinduwa, 2100 m (Oct. 23, 1963, fr.); Hati Sar–Minchin Dhap, 2700–2900 m (Oct. 28, 1963, fr.); Iladanda–Selap, 1800–2600 m (Nov. 9, 1963, fr.); Ghatte–Khebang, 1600–2400 m (Nov. 19, 1963, fr.); Mai Majuwa–Dhara Pani, 1500–1600 m (Dec. 4, 1963, fr.).

Distr. E. Himalaya (Nepal, Sikkim), Assam, Manipur, S. E. Tibet, and W. China (Yunnan, Szechuan).

Euonymus viburnoides Prain in Journ. Asia. Soc. Beng. **73**: 194 (1904)-Blakelock, l.c. 252 (1951).

Senchal, 2400 m (Apr. 16, 1960, no. 1959, fl.); St. Paul Hill, Darjeeling, 2200 m (Apr. 10, 1960, fl.; Mar. 14, 1963, fl.; Dec. 26, 1963, fr.); Tendong Peak, 2850 m (Mar. 26, 1963, fl.).

Distr. E. Himalaya (Sikkim, N. Bengal), and W. China (Yunnan).

The anther is imbedded in a carnose protuberance on the disk, and is dehiscent on the top.

Maytenus rufa (Wall.) Hara in Journ. Jap. Bot. **40**: 327 (1965).

Celastrus rufa Wallich in Roxburgh, Fl. Ind. ed. Carey, **2**: 397 (1824).

Catha rufa (Wall.) G. Don, Gen. Hist. **2**: 10 (1832).

Gymnosporia rufa (Wall.) Lawson in Fl. Brit. Ind. **1**: 620 (1875).

Dentam–Pamianchi, 1500–2000 m (May 12, 1960, no. 221, fr.); Taplethok–Helok, 1400–1500 m (Nov. 6, 1963).

Distr. Himalaya (Kumaon to Bhutan), and Khasia.

Reissantia arborea (Roxb.) Hara in Journ. Jap. Bot. **40**: 327 (1965).

Hippocratea arborea Roxburgh, Pl. Corom. **3**: 3, t. 205 (1819)–Fl. Brit. Ind. **1**: 625 (1875).

Pristimera arborea (Roxb.) A. C. Smith in Journ. Arn. Arb. **26**: 176 (1945).

Ghorwa–Sanichare, 300–200 m (Dec. 10, 1963, fr.).

Distr. Subtropical E. Himalaya (Nepal, Bhutan), Khasia, N. Burma, and W. China (S. Yunnan).

STAPHYLEACEAE (by Hiroshi Hara)

Turpinia nepalensis Wallich [Cat. no. 4277 (1830), nom. nud.] ex Wight et Arnott, Prodr. 156 (1834)–Fl. Assam **1** (2): 310 (1937)–Gagnepain in Fl. Gén. Ind.-Chin. Supp. **1**: 993 (1950).

T. pomifera DC. sensu Hiern in Fl. Brit. Ind. **1**: 698 (1875), p.p.

T. cochinchinensis Merr. sensu Merr. et Perry in Journ. Arn. Arb. **22**: 551 (1941).

Yoksam–Bakkim, 1700–2200 m (May 18, 1960, fl.); Helok–Iladanda, 1500–1800 m (Nov. 8, 1963, fr.); Khebang–Siling Tzokupa, 1700–2100 m (Nov. 20, 1963).

Distr. E. Himalaya (Nepal, Sikkim), Assam, N. Burma, Thai, Indo-China, and W. China?

ICACINACEAE (by Hiroshi Hara)

Natsiatum herpeticum Hamilt. ex [Wall., Cat. no. 4252 (1831), nom. nud.] Arnott in Edinb. New Philos. Journ. **16**: 314 (1834)–Fl. Brit. Ind. **1**: 595 (1875)–Sleumer in Engl., Pfl.-fam. ed. 2, **20 b**: 381, f. 101 F–H (1942).

Tharpu–Chyangthaphu, 1200–1300 m (Nov. 26, 1963, bud); Birwa–Yektin, 2900–1600 m (Nov. 28, 1963, fl.); Illam–Ranga Pani, 1200–400 m (Dec. 8, 1963, fl. light green); Ghorwa–Sanichare, 300–200 m (Dec. 10, 1963, fl.).

Distr. E. Himalaya (Nepal to NEFA), Assam, Naga Hills, and Burma.

ACERACEAE (by Hiroshi Hara)

Acer Campbellii Hook. f. et Thomson ex Hiern in Fl. Brit. Ind. **1**: 696 (1875)–Pax in Pfl.-reich IV–163, Ht. **8**: 21 (1902)–Rehder, Bibl. 421 (1949).

Takdah, 1600 m (Apr. 18, 1960, no. 1983, fl.); Rimbick, 2200 m (May 6, 1960, no. 108, fl.); Ramam–Phalut, 2400–3500 m (May 9, 1960, fl.); Darjeeling, 2000–2100 m (Jun. 18, 1960); Hati Sar–Minchin Dhap (Oct. 28, 1963); Taplethok–Helok (Nov. 6, 1963); Baroya Khimty, 2500 m (Nov. 11, 1963); Iladanda–Selap (Nov. 9, 1963, fr.); Mai Majuwa–Dhara Pani (Dec. 4, 1963).

Distr. Himalaya (Nepal to NEFA), and W. China (Yunnan).

Acer caudatum Wallich, Pl. Asia. Rar. **2**: 4 & 28, t. 132 (1831)–Fl. Brit. Ind. **1**: 695 (1875), p.p.–Rehder in Sargent, Tr. & Shr. **1**: 163 (1905); Bibl. 421 (1949)–Kitamura, Faun. & Fl. Nepal Himal. 175 (1955).

A. Papilio King in Journ. Asia. Soc. Beng. **65** (2): 115 (1896); in Ann. Bot. Gard. Calcut. **9**: 17, t. 24 (1901).

A. acuminatum Wall. ex Pax, l.c. 15 (1902), p.p.

Diorali Bhanjang, 3400 m (Nov. 14, 1963).

Distr. E. Himalaya (Kumaon to Sikkim).

Acer Hookeri Miquel in Arch. Néerl. Sci. Nat. **2**: 471 (1852)–Fl. Brit. Ind. **1**:

694 (1875)–Pax, l.c. 34 (1902)–Rehder, Bibl. 424 (1949).

Bakkim, 2500 m (May 19, 1960, fr. juv.).

Distr. E. Himalaya (Sikkim to NEFA).

Acer laevigatum Wallich, Pl. Asia. Rar. **2**: 3, t. 104 (1831)–Fl. Brit. Ind. **1**: 693 (1875)–Pax, l.c. 32 (1902)–Metcalf in Lingn. Sci. Journ. **11**: 207 (1932)–Rehder, Bibl. 424 (1949).

Rimbick–Ramam, 1900–2400 m (May 7, 1960, fl.); Taplethok–Helok, 1400–1500 m (Nov. 6, 1963).

Distr. Himalaya (Garhwal to Sikkim), Khasia, Manipur, N. Burma, and W. & S. China.

Acer oblongum Wallich ex DC., Prodr. **1**: 593 (1824)–Fl. Brit. Ind. **1**: 693 (1875)–Pax, l.c. 31 (1902)–Metcalf in Lingn. Sci. Journ. **11**: 194 (1932)–Rehder, Bibl. 424 (1949)–Kitamura, Faun. & Fl. Nepal Himal. 175 (1955).

Swayambhu Nath, Kathmandu, 1500 m (Sep. 23, 1963, fr.); Garhi Danra–Tuwa, 2200–1800 m (Nov. 4, 1963); Iladanda–Selap, 1800-2600 m (Nov. 9, 1963); Ghatte, 1600 m (Nov. 17, 1963).

Distr. Himalaya (Kashmir to Bhutan), Manipur, Indo-China, and W. China (east to Hupeh).

Acer pectinatum Wallich ex Nicholson in Gard. Chron. **1881** (1): 365, f. 69 (1881)–Pax, l.c. 67, f. 12 (1902).

Ramam–Phalut, 2400–3500 m (May 9, 1960, no. 168, fl.); Phalut–Chia Bhanjang, 3600–3100 m (May 11, 1960, no. 242, fl.); near Chia Bhanjang, 3200m (Jun. 2, 1960, nos. 741 & 753, defl.); Minchin Dhap–Mul Pokhari, 2900–2500 m (Oct. 29, 1963, fr.); Selap–Walunchung Gola (Nov. 10, 1963, fr.); below Siling Tzokupa (Nov. 21, 1963, fr.); Thakma Khola, 3200 m (Nov. 13, 1963).

Distr. Himalaya (Nepal, Sikkim).

The specimens cited above have 3- or 5-lobed leaves with caudately acuminate apex, simple racemes, 5-merous flowers, obovate petals nearly as long as sepals, intrastaminal disk, glabrous ovary, and horizontally or very widely spreading wings of samarae, but are variable in the shape and hairiness of leaves. The leaves are generally 3-lobed, but in the specimens from the Singalila range they are often 5-lobed, and the apex of leaves is caudately long acuminate as in *A. acuminatum* Wall. The first specimen (no. 168) cited above has young leaves glabrous beneath excepting rufous-barbate axils of veins, while most of other specimens have leaves rufous tomentose beneath especially along veins.

Acer sikkimense Miquel in Arch. Néerl. Sci. Nat. **2**: 471 (1852)–Fl. Brit. Ind. **1**: 694 (1875)–Pax, l.c. 34 (1902)–Rehder, Bibl. 424 (1949).

Darjeeling, 2200 m (Jun. 26, 1960, fr.); Zongi–Iladanda (Nov. 12, 1963).

Distr. sp. Himalaya (Nepal, Sikkim, Bhutan), Mishmi Hills, Tibet, N. Burma, and W. China.

Acer sterculiaceum Wallich, Pl. Asia. Rar. **2**: 3, t. 105 (1831).

A. villosum (non Presl 1822) Wallich, l.c. 4 (1831)–Fl. Brit. Ind. **1**: 695 (1875)–Pax, l.c. 71 (1902)–Rehder, Bibl. 426 (1949).

Garibans–Tonglu, 2800–3000 m (Jun. 7, 1960); Minchin Dhap–Mul Pokhari, 2900–2500 m (Oct. 29, 1963, fr.); Selap–Walunchung Gola (Nov. 10, 1963); Thakma Khola, 3100 m (Nov. 12 & 16, 1963); Bhuspate Danra, 2800 m (Dec. 2, 1963, fr.).

Distr. Himalaya (Kashmir to Nepal).

Acer Thomsonii Miquel in Arch. Néerl. Sci. Nat. **2**: 470 (1867)–Pax, l.c. 71 (1902).

A. villosum var. *Thomsoni* (Miq.) Hiern in Fl. Brit. Ind. **1**: 695 (1875).

Kurseong, 1600 m (Apr. 11, 1960, fr.); Rabong La–Temi, 1200 m (Mar. 28, 1963, fr.).

Distr. E. Himalaya (Sikkim, Bhutan).

HIPPOCASTANACEAE (by Hiroshi Hara)

Aesculus assamica Griffith, Notul. Pl. Asia. **4**: 540 (1854)–Hardin in Brittonia **12**: 36, figs. (1960).

A. punduana Wall. [Cat. no. 1189 (1829), nom. nud.] ex Hiern in Fl. Brit. Ind. **1**: 675 (1875).

Kalimpong, cult., 1300 m (Jun. 19, 1960, fr.).

Distr. Tropical Himalaya (Sikkim, Bhutan), Assam, N. Burma, N. Thai, Laos, and S. W. Yunnan.

Aesculus indica (Camb.) Hooker in Bot. Mag. t. 5117 (1859)–Fl. Brit. Ind. **1**: 675 (1875)–Hardin in Brittonia **12**: 35, figs. (1960).

Pavia indica Wall. ex Cambessed. in Jacquemont, Voy. Ind. **4**: 31, t. 35 (1844).

Kathmandu, planted, 1400 m (Oct. 13, 1963, fr.).

Distr. N. Afghanistan, and Himalaya (Kashmir to Nepal).

SAPINDACEAE (by Hiroo Kanai)

Aphania rubra (Roxb.) Radlk., Sap. Holl.-Ind. 21, 69 (91, 220) (1877–78); in Sitzungsber. Akad. Wiss. Muench. **8**: 238, 298, n. 10 & 302, n. 77 (1878); in Pfl.-reich IV–165, Ht. **98c**: 714 (1932).

Scytalia rubra Roxb. [Hort. Beng. 29 (1814), nom. nud.] Fl. Ind. ed. 2, **2**: 272 (1832).

Sapindus attenuatus Wall. [Cat. no. 8037 (1847), nom. nud.] ex Hiern in Fl. Brit. Ind. **1**: 684 (1875), p.p.

Rayang, Darjeeling, 250 m (Apr. 21, 1960, fr.); Chisa Pani–Loohya Mai, 500 m (Dec. 9, 1963, bud).

Distr. E. Himalaya (Nepal, Sikkim, Bhutan), Bengal, Assam, and Burma.

Cardiospermum Halicacabum L., Sp. Pl. ed. 1, 366 (1753)–Fl. Brit. Ind. **1**: 670 (1875)–Radlk., l.c. **98 b** : 379 (1932).

Phusri–Sanguri Bhanjang, 500 m (Oct. 16, 1963, fr.); Tamur Bridge–Dhankuta, 800 m (Oct. 17, 1963, fr.).

Distr. Tropics and subtropics.

Mischocarpus pentapetalus (Roxb.) Radlk., Sap. Holl.-Ind. 43, (113) (1877); in Sitzungsber. Akad. Wiss. Muench. **9**: 536, n. 504 etc. & 646, 648 (1879); in Pfl.-reich IV–165, Ht. **98 g**: 1293 (1933).

Schleichera pentapetala Roxb. [Hort. Beng. 29 (1814), nom. nud.] Fl. Ind. ed. 2, **2**: 275 (1832).

Cupania pentaphylla Wight, Icon. t. 402 (1843).

C. pentapetala Hiern in Fl. Brit. Ind. **1**: 678 (1875)

Loohya Mai–Ghorwa, 400 m (Dec. 9, 1963, fr.).

Distr. Nepal, Bengal, Assam, Burma, Thai, Indo-China, and China.

Sapindus Mukorossi Gaertn., Fruct. et Sem. **1**: 342, t. 70, f. 3 g, h (1788)–Fl. Brit. Ind. **1**: 683 (1875)–Hara, Enum. Sperm. Jap. **3**: 120 (1954).

Garhi Danra–Linkhim, 1700 m (Nov. 4, 1963); Illam, 1200 m (Dec. 7, 1963, fr.).

Distr. Himalaya, Assam, Burma, Indo-China, China, Formosa, Quelpaert, and Japan.

SABIACEAE (by Hiroshi Hara)

Meliosma dilleniifolia (Wall.) Walpers, Rep. **1**: 423 (1842), ut *dilleniaefolia*–Fl. Brit. Ind. **2**: 4 (1876).

Millingtonia dilleniaefolia Wall. ex Wight et Arnott in Edinb. New Philos. Journ. **15**: 179 (1833).

Garibans–Tonglu, 2800–3000 m (Jun. 7, 1960, bud); Minchin Dhap–Mul Pokhari, 2800–2500 m (Oct. 29, 1963, fr.); Bilbatay Bhanjang–Hati Sar, 2400–2700 m (Oct. 27, 1963).

Distr. Himalaya (Simla to Sikkim).

Meliosma pungens (Wall.) Walpers, Rep. **1**: 423 (1842)–Fl. Brit. Ind. **2**: 4 (1876)–Merrill in Brittonia **4**: 110 (1941).

Millingtonia pungens Wall. ex Wight et Arnott in Edinb. New Philos. Journ. **15**: 178 (1833).

Iladanda–Selap, 1800–2600 m (Nov. 9, 1963); Zongi–Iladanda, 2600–1800 m (Nov. 12, 1963).

Distr. Himalaya (Kashmir to NEFA), S. Tibet, N. Burma, and W. China.

Meliosma simplicifolia (Roxb.) Walpers, Rep. **1**: 423 (1842)–Fl. Brit. Ind. **2**: 5 (1876)–How in Act. Phytotax. Sin. **3**: 428 (1955).

Millingtonia simplicifolia Roxburgh, Pl. Corom. **3**: 50, t. 254 (1819); Fl. Ind. ed. Carey, **1**: 102 (1820).

Ranga Pani–Ghorwa, 600–300 m (Dec. 9, 1963, bud).

Distr. Himalaya (Nepal to Bhutan), Khasia, south to Ceylon, Burma, Indo-China, and W. China.

Sabia campanulata Wall. ex Roxburgh, Fl. Ind. ed. Carey, **2**: 311 (1824)–Fl. Brit. Ind. **2**: 1 (1876)–Chen in Sargentia **3**: 37 (1943).

Chia Bhanjang–Dentam, 3000 m (May 11, 1960, fl.); Garibans–Tonglu, 2800–3500 m (Jun. 7, 1960, fl.); Thakma Khola, 3000 m (Nov. 13, 1963, fr.).

Distr. Himalaya (Kashmir to NEFA).

Sabia leptandra Hook. f. et Thomson, Fl. Ind. **1**: 209 (1855)–Fl. Brit. Ind. **2**: 2 (1876)–Chen, l.c. 39 (1943).

Darjeeling, 2000 m (Apr. 5, 1960, fl.); Senchal–Takdah, 2400–1600 m (Apr. 17, 1960, fr.); Chia Bhanjang–Dentam (May 11, 1960); Bakkim–Jongri, 2500–4000 m (May 19, 1960, no. 424, fr.); Tendong Peak–Damthang, 2400 m (Mar. 26, 1963, fl.); Birwa–Yektin, 2000–1600 m (Nov. 28, 1963, fr.).

Distr. E. Himalaya (E. Nepal to Bhutan).

BALSAMINACEAE (by Hiroshi Hara)

Impatiens arguta Hook. f. et Thomson in Journ. Linn. Soc. **4**: 137 (1860)–Fl. Brit. Ind. **1**: 470 (1875)–Hook. f. in Rec. Bot. Survey Ind. **4** (2): 17 & 22 (1905).

I. Gagei Hook. f. in Hook., Icon. Pl. t. 2951 (1911), e typo.

Tingling Bridge–Yoksam, 1000–1700 m (May 16, 1960, no. 315, fl.); Yoksam, 1700 m (May 17, 1960, fl.); Yoksam–Bakkim, 1700–2200 m (May 18, 1960, fl.); Gangtok, 1500 m (Jun. 15, 1960, fl.); Darjeeling, 2000–2150 m (Jun. 18 & 24, 1960; Sep. 10 & 15, 1964, fl.); Murhay, 2100 m (Oct. 23, 1963, fl.).

Distr. E. Himalaya (E. Nepal to Bhutan), S. Tibet, Khasia, Manipur, Burma, and W. China.

Impatiens bicornuta Wallich in Roxb., Fl. Ind. ed. Carey, **2**: 460 (1824)–Fl. Brit. Ind. **1**: 475 (1875)–Hook. f., l.c. 14 & 19 (1905).

Gatribas–Tonglu, 2800–3000 m (Sep. 17, 1964, fl.).

Distr. Himalaya (Garhwal to Sikkim).

Impatiens cristata Wallich in Roxb., Fl. Ind. ed. Carey, **2**: 456 (1824)–Hook. f., l.c. 18 & 22 (1905).

Sinduwa–Chitray, 2100 m (Oct. 24, 1963, fl. whitish).

Distr. Himalaya (Nepal to Bhutan).

Impatiens decipiens Hook. f. in Rec. Bot. Survey Ind. **4** (2): 17 & 22 (1905).

Below Gangtok, 1100–1400 m (Jun. 17, 1960, fl.).

Distr. E. Himalaya (Sikkim), and S. Tibet.

Impatiens discolor DC., Prodr. **1**: 687 (1824)–Fl. Brit. Ind. **1**: 471 (1875)–Hook. f., l.c. 20 (1905).

Chitray, 2100 m (Oct. 24, 1963, fl.); Kala Pokhari–Sandakphu, 3000–3500 m (Sep. 16, 1964, fl.).

Distr. E. Himalaya (Nepal, Sikkim).

Impatiens drepanophora Hook. f. in Rec. Bot. Survey Ind. **4** (2): 17 & 22 (1905)–Toppin in Kew Bull. **1920**: 364, fig. (1920).

Pamianchi–Tingling Bridge, 2000–1000 m (May 15, 1960, no. 276, fl.).

Distr. E. Himalaya (E. Nepal, Sikkim), Khasia, and Manipur.

Impatiens exilis Hook. f. in Rec. Bot. Survey Ind. **4** (2): 13 & 19 (1905).

Gangtok, 1600 m (Jun. 16, 1960, fl.); Sanguri Bhanjang, 900–1200m (Oct. 16, 1963, fl.); below Chumbhati, 500 m (Sep. 10, 1964, fr.); Namli, 900 m (Sep. 12, 1964, fl.).

Distr. E. Himalaya (E. Nepal, Sikkim).

Impatiens falcifer Hook. f. in Bot. Mag. t. 7923 (1903); l.c. 18 & 23 (1905).

I. serrata Benth. sensu Fl. Brit. Ind. **1**: 473 (1875), p.p.

Diorali Bhanjang, 3100 m (Nov. 14, 1963, fl., fr.).

Distr. E. Himalaya (E. Nepal, Sikkim).

Impatiens graciliflora Hook. f. in Rec. Bot. Survey Ind. **4** (2): 15 & 21 (1905).

Rimbick–Ramam, 2200–2400 m (May 7, 1960, fl.); Ghum–Kurseong, 2000 m (Jun. 22, 1960, fl.); Darjeeling, 2150 m (Sep. 10, 1964, fl.).

Distr. E. Himalaya (Sikkim).

Impatiens insignis DC., Prodr. **1**: 688 (1824)–Wall., Pl. Asia. Rar. **2**: 83, t. 194 (1831)–Fl. Brit. Ind. **1**: 477 (1875)–Hook. f., l.c. 14 & 20 (1905).

Godavari, Kathmandu, 1500 m (Sep. 18, 1963, fl.); Sunderijal Waterfall, 1600 m (Sep. 20, 1963, fl.); Nissim–Dumhan, 1200 m (Oct. 30, 1963); Taplejung, 1500–1900 m (Oct. 31 & Nov. 1, 1963, fl.); Taplejung–Garhi Danra, 1900–2200 m (Nov. 3, 1963, fl.); Tuwa–Taplethok, 1800–1400 m (Nov. 5, 1963, fl.).

Distr. E. Himalaya (Nepal).

Impatiens Jurpia Hamilt. ex Hook. f. et Thoms. in Journ. Linn. Soc. **4**: 140 (1860)-Fl. Brit. Ind. **1**: 471 (1875)-Hook. f., l.c. 14 & 20 (1905).

Birch Hill, Darjeeling, 2000 m (Jun. 18, 1960 & Sep. 21, 1964, fl.); Sanguri Bhanjang-Dhara Pani, 1200–900 m (Oct. 16, 1963, fl.).

Distr. E. Himalaya (Nepal to Bhutan), Khasia, and N. Burma.

Impatiens leptoceras DC., Prodr. **1**: 688 (1824)-Fl. Brit. Ind. **1**: 477 (1875)-Hook. f., l.c. 16 & 21 (1905).

I. longicornu Wall. in Roxb., Fl. Ind. ed. Carey, **2**: 462 (1824).

Sunderijal Waterfall, Kathmandu, 1600 m (Sep. 20, 1963, fl. yellow).

Distr. C. Nepal.

Impatiens Pradhani Hara in Journ. Jap. Bot. **40**: 99 (1965).

Near Lagyap, 2000–2300 m (Sep. 13, 1964, fl.—Typus).

Distr. Endemic in Sikkim.

The species is very near to *I. bicornuta* Wallich, but differs from the latter in having broadly winged stems, and longer projecting appendages at the mouth of lip.

Impatiens puberula DC., Prodr. **1**: 687 (1824)-Wall., Pl. Asia. Rar. **2**: t. 193 (1831)-Fl. Brit. Ind. **1**: 470 (1875)-Hook. f., l.c. 17 & 22 (1905).

Ghum–Lopchu, 2000 m (Jun. 19, 1960, fl.); Murhay, 2100 m (Oct. 23, 1963, fl.).

Distr. E. Himalaya (Nepal, Sikkim).

Impatiens racemosa DC., Prodr. **1**: 688 (1824)-Hook. f., l.c. 16 & 21 (1905).

I. laxiflora Edgew. sensu Fl. Brit. Ind. **1**: 479 (1875), p.p.

I. microsciadia Hook. f., l.c. 16 & 21 (1905).

Gangtok, 1500 m (Jun. 15, 1960, fl.); Kakani, 2150 m (Sep. 24, 1963); Murhay-Sinduwa, 2100m (Oct. 23, 1963, fl.); Garhi Danra–Tuwa, 2200–1800m (Nov. 4, 1963); Darjeeling, 2150 m (Sep. 10, 1964, fl.); Lagyap, 2000–2300 m (Sep. 13, 1964, fl.).

Distr. Himalaya (Kashmir to Sikkim), S. Tibet, and Khasia.

I. microsciadia seems to differ from *I. racemosa* only in the shape of sepals. In typical *I. racemosa*, the sepals have an oval lamina with a gland on one side in the upper part and a short awn, while in typical *I. microsciadia*, the sepals have a very small lamina without gland and an awn much longer than the laminal part. But some specimens have sepals intermediate between the two extreme forms.

Impatiens radiata Hook. f. in Fl. Brit. Ind. **1**: 476 (1875)-Hook. f., l.c. 15 & 20 (1905).

I. racemosa Wall. sensu Hook. f. et Thoms. in Journ. Linn. Soc. **4**: 147 (1860), p.p.

Chitray, 2100 m (Oct. 24, 1963, fl.); Minchin Dhap–Mul Pokhari, 2900–2500 m (Oct. 29, 1963, fl.); Taplejung–Garhi Danra, 1900–2200 m (Nov. 3, 1963, fr.).

Distr. E. Himalaya (E. Nepal, Sikkim), and Khasia.

Impatiens scabrida DC., Prodr. **1**: 687 (1824)-Fl. Brit. Ind. **1**: 472 (1875).

I. praetermissa Hook. f. in Journ. Linn. Soc. **37**: 29 (1904); in Rec. Bot. Survey Ind. **4** (2): 18 & 23 (1905).

Godavari, Kathmandu, 1500 m (Sep. 18, 1963, fl. yellow).

Distr. Himalaya (Kunawar to Bhutan).

Impatiens spirifer Hook. f. et Thoms. in Journ. Linn. Soc. **4**: 135 (1860)-Fl. Brit. Ind. **1**: 471 (1875)-Hook. f., l.c. 17 & 22 (1905).

Mangalbare, 2600 m (Oct. 28, 1963, fl.); Darjeeling, 2150 m (Sep. 15 & 22, 1964, fl.); Gatribas, 2800 m (Sep. 16, 1964, fl.).

Distr. E. Himalaya (E. Nepal, Sikkim), and S. Tibet.

Impatiens stenantha Hook. f. in Fl. Brit. Ind. **1**: 478 (1875)-Hook. f., l.c. 17 & 22 (1905).

Palmajua-Rimbick, 1500–2200 (May 5, 1960, fl.); Gangtok, 1500 m (Jun. 15, 1960, fl.); Murhay-Sinduwa, 2100 m (Oct. 23 & 24, 1963, fl.); Mul Pokhari-Nissim, 1800 m (Oct. 30, 1963, fl.); Taplejung-Garhi Danra, 1900–2200 m (Nov. 3, 1963, fl.); Khebang-Siling Tzokupa, 1700–2100 m (Nov. 20, 1963, fl.); Gatribas, 2800 m (Sep. 16 & 17, 1964, fl.).

Distr. E. Himalaya (Nepal, Sikkim).

Impatiens tripetala Roxburgh ex DC., Prodr. **1**: 687 (Jan. 1824)-Roxb., Fl. Ind. ed. Carey, **2**: 453 (1824)-Fl. Brit. Ind. **1**: 470 (1875)-Hook. f., l.c. 13 & 19 (1905)-Toppin in Kew Bull. **1920**: 358, fig. (1920).

Linkhim-Tuwa, 1700–1900m (Nov. 4, 1963, fl.); Kiwa-Taplethok, 1600–1400 m (Nov. 5, 1963, fl. deep purple red.)

Distr. E. Himalaya (Nepal to NEFA), Khasia, Manipur, and Burma.

RHAMNACEAE (by Yasuiti Momiyama)

Berchemia flavescens (Wall.) Brongniart in Ann. Sci. Nat. **10**: 357 (Mém. Fam. Rhamn. 50) (1826)-C. K. Schneider in Pl. Wilson. **2**: 219 (1914).

Zizyphus flavescens Wall. ex Roxb., Fl. Ind. ed. Carey, **2**: 637 (1824).

Berchemia flavescens Wall. ex Lawson in Hook. f., Fl. Brit. Ind. **1**: 637 (1875).

Hati Sar-Minchin Dhap, 2700–2900 m (Oct. 28, 1963, fl.); Minchin Dhap-Mul Pokhari, 2900–2500 m (Oct. 29, 1963, fl.); Birwa-Yektin, 1600–2900 m (Nov. 28, 1963, fl.).

Distr. E. Himalaya (Nepal, Sikkim).

Berchemia floribunda (Wall.) Brongniart in Ann. Sci. Nat. **10**: 357, t. 13, 1 (Mém. Fam. Rhamn. 50) (1826)-C. K. Schneid., l.c. 219 (1914).

Zizyphus floribunda Wall. ex Roxb., Fl. Ind. ed. Carey, **2**: 368 (1824).

Berchemia floribunda Wall. ex Laws., l.c. **1**: 637 (1875).

Darjeeling, 2100 m (Jun. 22, 1960, bud); Thakma Khola, 3000 m (Nov. 13, 1963).

Distr. Himalaya (Jhelum, Nepal to Sikkim), Khasia, and W. China.

Gouania leptostachya DC., Prodr. **2**: 40 (1825)-Laws., l.c. **1**: 634 (1875), det. H. Kanai.

Khebang-Siling Tzokupa, 1700–2100 m (Nov. 20, 1963, fr.); Khebang-Bharomdin, 1700–1000 m (Nov. 24, 1963, fr.); Tharpu-Chyangthaphu, 1200–1300m (Nov. 26, 1963, fr.); Ranga Pani-Ghorwa, 700–300 m (Dec. 9, 1963, fr.); Ghorwa-Sanichare, 300–200 m (Dec. 10, 1963, fr.).

Distr. Himalaya (Kumaon to Assam), Khasia, Banda, Burma, Malay Peninsula, and Java.

Hovenia acerba Lindl. in Bot. Reg. **6**: t. 501 (1820)-DC., Prodr. **1**: 40 (1824)-Y. Kimura in Bot. Mag. Tokyo **53**: 477, fig. 16 (1939).

Hovenia dulcis (non Thunb. 1781) Roxb., Fl. Ind. ed. Carey, **2**: 414 (1824);

ed. 2, **1**: 630 (1832)-Laws., l.c. 650 (1875).

Khebang-Bharomdin, 1700–1000 m (Nov. 24, 1963, fr.).

Distr. Himalaya (Chamba and Hazara to Bhutan).

Rhamnus purpureus Edgew. in Trans. Linn. Soc. **20**: 44 (1846)-Laws., l.c. 639 (1875)-Kitamura, Faun. & Fl. Nepal Himal. 177 (1955).

Ramam–Phalut, 2400–3500 m (May 9, 1960, fl.).

Distr. Himalaya (Marri to Kumaon, Nepal).

Rhamnus virgatus Roxb., Fl. Ind. ed. Carey, **2**: 351 (1824); ed. 2, **1**: 604 (1832)-DC., Prodr. **2**: 24 (1825).

Rhamnus dahuricus Pallas sensu Laws. in Fl. Brit. Ind. **1**: 639 (1875).

Sunderijal Waterfall, Kathmandu, 1600 m (Sep. 20, 1963, fr.).

Distr. Himalaya (Punjab to Bhutan), and W. China.

Sageretia oppositifolia (Wall.) Brongniart in Ann. Sci. Nat. **10**: 360, t. 13, 2 (Mém. Fam. Rhamn. 53) (1826)-Laws., l.c. 641 (1875)-Suessenguth in Engl., Pfl.-fam. ed. 2, **20d**: 56 (1953).

Zizyphus oppositifolia Wall. in Roxb., Fl. Ind. ed. Carey, **2**: 370 (1824).

Sageretia filiformis C. K. Schneid. in Pl. Wilson. **2**: 231 (1914), p.p.

Taplethok–Helok, 1400–1500 m (Nov. 6, 1963, fl.).

Distr. Himalaya (Peshawar and Rajaori to Nepal), India, and Malaysia.

Zizyphus incurva Roxb., Fl. Ind. ed. Carey, **2**: 364 (1824); ed. 2, **1**: 614 (1832)-Laws., l.c. 635 (1875).

Godavari, Kathmandu, 1500 m (Sep. 18, 1963, fr.); Phusri–Dhara Pani, 500–1200 m (Oct. 16, 1963, fr.); Dhankuta, 1200 m (Oct. 19, 1963, fr.); Tuwa–Taplethok, 1800–1400 m (Nov. 5, 1963, fr.); Taplethok–Helok, 1400–1500 m (Nov. 6, 1963, fr.).

Distr. E. Himalaya (Nepal, Bhutan), India, and W. China.

Zizyphus mauritiana Lam., Encycl. Méth. **3**: 319 (1789). [Pl. 9 b]

Zizyphus Jujuba Lam., Encycl. Méth. **3**: 318 (1789)-Laws., l.c. 632 (1875).

Biratnagar, 200 m (Oct. 14, 1963, fl. & fr.); Dhara Pani–Dhankuta, 300–1000 m (Oct. 17, 1963, fr.); Ghorwa–Sanichare, 300–200 m (Dec. 14, 1963, fr.); Kathgara–Rangali, 200 m (Dec. 14, 1963, fr.).

Distr. Tropical Africa, Afghanistan, Himalaya, India (wild and cultivated), Malaysia, China, and Australia.

Zizyphus xylopyrus Willd., Sp. Pl. **1**: 1104 (1789)-Roxb., Fl. Ind. ed. Carey, **2**: 360 (1824)-Laws., l.c. 634 (1875).

Ranga Pani–Ghorwa, 700–300 m (Dec. 9, 1963).

Distr. E. Himalaya (Nepal), India, and Ceylon.

VITACEAE (by Yasuiti Momiyama)

Ampelocissus divaricata (Wall.) Planch. in DC., Monogr. Phan. **5**: 378 (1887).

Vitis divaricata Wall. ex Lawson in Hook. f., Fl. Brit. Ind. **1**: 675 (1875).

Dhara Pani–Dhankuta, 300–1000 m (Oct. 17, 1963, fr.); Illam–Ranga Pani, 1200–400 m (Dec. 8, 1963); Ranga Pani–Ghorwa, 700–300 m (Dec. 9, 1963, fr.).

Distr. Himalaya (Garhwal to E. Nepal), Assam, and Indo-China.

Ampelocissus sikkimensis (Laws.) Planch. in DC., Monogr. Phan. **5**: 378 (1887).

Vitis sikkimensis Laws. in Hook. f., Fl. Brit. Ind. **1**: 650 (1875).

Garhi Danra–Tuwa, 2200–1800 m (Nov. 4, 1963).

Distr. E. Himalaya (E. Nepal, Sikkim), and Khasia.

Cayratia japonica (Thunb.) Gagnep. in Not. Syst. **1**: 349 (1911)–Hara, Enum. Sperm. Jap. **3**: 135 (1954).

var. **mollis** (Wall. ex Laws.) Momiyama, comb. nov.

Vitis mollis Wall. ex Laws. in Hook. f., Fl. Brit. Ind. **1**: 660 (1875).

Cissus] *japonica* Willd. var. *mollis* (Wall.) Planch. in DC., Monogr. Phan. **5**: 562 (1887).

Haec varietas a planta typica japonica serraturis et nervis foliorum numerosioribus bene recognoscenda. An species propria?

Tista, 400 m (Apr. 26, 1960, fl.); Siliguri–Kurseong, 200–1500 m (Apr. 29, 1960, fr.).

Distr. E. Himalaya (Sikkim), Khasia, and Bengal.

var. *mollis* f. **glabra** Momiyama, f. nov.

Vitis tenuifolia Laws. in Hook. f., Fl. Brit. Ind. **1**: 660 (1875), p.p.

Cissus tenuifolia Planch. in DC., Monogr. Phan. **5**: 563 (1887), in nota, quoad pl. himal. et gangetic.

Folia glabra.

Pamianchi–Ratong Chu, 2000–1000 m (May 15, 1960, fl.—Typus in TI); Pamianchi–Tingling Bridge, 2000–1000 m (May 15, 1960, fl.); Tingling Bridge–Yoksam, 1000–1700 m (May 16, 1960, fl.).

Distr. E. Himalaya (Nepal, Sikkim), Assam, and Khasia.

Cayratia trifolia (L.) Domin in Biblioth. Bot. **89**: 371 (1927)–Suessenguth in Engl., Pfl.-fam. ed. 2, **20d**: 280 (1953).

Vitis trifolia L., Sp. Pl. ed. 1, **1**: 203 (1753).

Cissus carnosa Lam., Encycl. Méth. **1**: 31 (1789)–Willd., Sp. Pl. **1**: 658 (1797) –Roxb., Fl. Ind. ed. Carey, **1**: 427 (1820)–DC., Prodr. **1**: 630 (1824)–Planch. in DC., Monogr. Phan. **5**: 570 (1887).

Vitis carnosa Wall. ex Laws. in Hook. f., Fl. Brit. Ind. **1**: 654 (1875).

Biratnagar, 200 m (Oct. 14, 1963, fr.).

Distr. Tropical Himalaya, from Punjab and Burma to Ceylon and Malacca, Assam, Indo-China, China, and Malaysia.

Cissus javana DC., Prodr. **1**: 628 (1824)–Suessenguth in Engl., Pfl.-fam. ed. 2, **20d**: 264 (1953).

Cissus discolor Bl., Bijdr. **1**: 181 (1825)–Planch. in DC., Monogr. Phan. **5**: 496 (1887).

Vitis discolor (Bl.) Dalz. in Hook. Kew Journ. Bot. **2**: 39 (1850)–Laws., l.c. 647 (1875).

Phursi–Dhara Pani, 450–1200 m (Oct. 16, 1963, fr.); Dhankuta, 1200 m (Oct. 30, 1963, fr.); Gorzu Kosir–Dumhan (Oct. 30, 1963, fr.); Illam–Ranga Pani, 1200–400 m (Dec. 8, 1963); Ranga Pani–Ghorwa, 700–300m (Dec. 9, 1963, fr.); Sanichare–Sibganja, 200 m (Dec. 11, 1963, fr.).

Distr. E. Himalaya (E. Nepal, Sikkim), Khasia, India, Burma, Thai, Indo-China, W. China, and Malaysia.

Leea acuminata Wall. ex C. B. Clarke in Journ. Bot. **19**: 102 (1881).

Tista, 400 m (Jun. 19, 1960, fl.).

Distr. E. Himalaya (Sikkim to N. Assam), Garrow Hills, and Manipur.

Leea aequata L., Mant. Pl. **1**: 124 (1767)–Clarke in Journ. Bot. **19**: 163 (1881).

Leea hirta Roxb., Fl. Ind. ed. Carey, **2**: 469 (1824)–Laws., l.c. 668 (1875).

Peshok–Tista, 400 m (Jun. 13, 1960, fl.); Ghorwa–Sanichare, 300–200 m (Dec. 10, 1960).

Distr. E. Himalaya (Nepal to Bhutan), Bengal, and Burma.

Leea crispa L., Mant. Pl. **1**: 124 (1767)–Willd., Sp. Pl. **1**: 1177 (1797)–Roxb., Fl. Ind. ed. Carey, **2**: 467 (1824)–Laws. in Hook. f., Fl. Brit. Ind. **1**: 665 (1875), p.p.–Clarke in Journ. Bot. **19**: 135 (1881).

Ghorwa–Sanichare, 300–200 m (Dec. 10, 1963); Sibganja–Gauriganja, 200 m (Dec. 12, 1963).

Distr. E. Himalaya (E. Nepal), Assam, Burma, and Indo-China.

Leea herbacea Hamilt.. ex C. B. Clarke in Journ. Bot. **19**: 137 (1881).

Kurseong–Siliguri, 1500–200 m (Jun. 29, 1960, fl.); Ghorwa–Sanichare, 300–200 m (Dec. 10, 1960).

Distr. E. Himalaya (Nepal and eastwards), Khasia, and Burma.

Leea robusta Roxb., Fl. Ind. ed. Carey, **2**: 468 (1824); ed. 2, **1**: 655 (1832)–Clarke in Journ. Bot. **19**: 163 (1881).

Leea diffusa Laws. in Hook. f., Fl. Brit. Ind. **1**: 667 (1875).

Dhankuta, 1200 m (Oct. 19, 1963); Khebang–below Siling Tzokupa, 1700–2100 m (Nov. 20, 1963); Ranga Pani–Ghorwa, 700–300 m (Dec. 9, 1963, fr.); Dharan, 400 m (Dec. 15, 1963, fr.).

Distr. E. Himalaya (Nepal, Sikkim), Khasia, Burma, and Andamans.

Leea umbraculifera C. B. Clarke in Journ. Bot. **19**: 141 (1881).

Leea sambucina Laws., l.c. 666 (1875), p.p.

Illam–Ranga Pani, 1200–400 m (Dec. 8, 1963); Ranga Pani–Ghorwa, 700–300 m (Dec. 9, 1963, fl.).

Distr. E. Himalaya (E. Nepal to Bhutan), and Khasia.

Parthenocissus semicordata (Laws.) Planch. in DC., Monogr. Phan. **5**: 451 (1887).

Vitis himalayana Brandis var. *semicordata* Laws. in Hook. f., Fl. Brit. Ind. **1**: 656 (1875).

Sinduwa, 2100 m (Oct. 24, 1963); Bilbatay Bhanjang–Hati Sar, 2200–2900 m (Oct. 27, 1963, fr.); Taplethok–Helok, 1400–1500 m (Nov. 6, 1963).

Distr. E. Himalaya (E. Nepal), and Khasia.

Tetrastigma bracteolatum (Wall.) Planch. in DC., Monogr. Phan. **5**: 428 (1887).

Vitis bracteolatum Wall. ex Laws. in Hook. f., Fl. Brit. Ind. **1**: 654 (1875).

Ghorwa–Sanichare, 300–200 m (Dec. 10, 1963, fl.).

Distr. E. Himalaya (E. Nepal to Bhutan), and Assam.

Tetrastigma dubium (Laws.) Planch. in DC., Monogr. Phan. **5**: 473 (1887).

Vitis dubia Laws. in Hook. f., Fl. Brit. Ind. **1**: 661 (1875).

Takdah–Rayang, 250 m (Apr. 20, 1960, fr.); Rayang, 250 m (Apr. 21, 1960, fr.); Tharpu–near Chyangthaphu, 1200–1300 m (Nov. 26, 1963); Illam–Ranga Pani, 1200–700 m (Dec. 8, 1963); Ranga Pani–Ghorwa, 700–300 m (Dec. 9, 1963, fr.); Sanichare–

Sibganja, 200 m (Dec. 11, 1963).

Distr. E. Himalaya (E. Nepal, Sikkim), Assam, and W. China.

Tetrastigma Hookeri (Laws.) Planch. in DC., Monogr. Phan. **5**: 428 (1887).

Vitis Hookeri Laws. in Hook. f., Fl. Brit. Ind. **1**: 661 (1875).

Tuwa–Taplethok, 1800–1400 m (Nov. 5, 1963).

Distr. E. Himalaya (E. Nepal to Bhutan), Assam, Khasia, and Java.

Tetrastigma rumicispermum (Laws.) Planch. in DC., Monogr. Phan. **5**: 429 (1887).

Vitis rumicisperma Laws. in Hook. f., Fl. Brit. Ind. **1**: 661 (1875).

Palmajua–Rimbick, 2300–2200 m (May 5, 1960, fl.); Yoksam, 1700 m (May 17, 1960, fl.); Yoksam–Bakkim (May 18, 1960, fl.); Garhi Danra–Tuwa, 1800–2200 m (Nov. 4, 1963); Helok–Iladanda, 1500–1800 m (Nov. 8, 1963, fr.); Ghatte–Khebang, 1600–2400 m (Nov. 19, 1963, fr.).

Distr. E. Himalaya (Nepal, Sikkim), and Khasia.

Tetrastigma serrulatum (Roxb.) Planch. in DC., Monogr. Phan. **5**: 432 (1887).

Cissus serrulata Roxb., Fl. Ind. ed. Carey, **1**: 432 (1820); ed. 2, **1**: 414 (1832)–DC., Prodr. **1**: 632 (1824).

Vitis capriolata D. Don, Prodr. Fl. Nepal. 188 (1825)–Laws., l.c. 659 (1875).

Cissus capriolata Royle, Ill. Bot. Himal. **1**: 149 t. 26, fig. 2 (1839).

Vitis serrulata Wall. ex Miq., Ann. Mus. Bot. Lugd.-Bat. **1**: 77 (1863).

Batasi–Palmajua, 2300–2600 m (May 3, 1960, fl.); Rimbick–Ramam, 1900–2400 m (May 7, 1960, fl.); Birch Hill, Darjeeling, 2000 m (Jun. 18, 1960, fr.); Damthang–Temi, 2200–1800 m (May 25, 1963, fr.); Sinduwa, 2100 m (Oct. 24, 1963); Bilbatay Bhanjang, 2200 m (Oct. 26, 1963, fr.); Mul Pokhari–Dumhan, 2500–700 m (Oct. 30, 1963); Taplejung, 1700 m (Nov. 2, 1963); Taplejung–Garhi Danra (Nov. 3, 1963); Taplethok, 1800–1400 m (Nov. 5, 1963); below Siling Tzokupa–Khebang, 2100–1700 m (Nov. 22, 1963); Khebang–Bharomdin, 1700–1000 m (Nov. 24, 1963); Bhandukay–Ghatte, 2500–1600 m (Nov. 16, 1963); Godavari, Kathmandu, 1500 m (Sep. 18, 1963, fl.); Kakani Hill, 2100 m (Sep. 24, 1963, fl.).

Distr. Himalaya (Garhwal to Bhutan), Assam, Burma, Thai, Indo-China, and W. China.

Vitis lanata Roxb., Fl. Ind. ed. Carey, **2**: 474 (1824); ed. 2, **1**: 660 (1832)–Laws., l.c. 651 (1875), p.p.–Planch. in DC., Monogr. Phan. **5**: 329 (1887).

Sanichare–Sibganja, 200 m (Dec. 11, 1963).

Distr. Himalaya (Kashmir to Sikkim), Assam, Burma, and W. & C. China.

Vitis parvifolia Roxb., Fl. Ind. ed. Carey, **2**: 475 (1824); ed. 2, **1**: 662 (1832)–Laws., l.c. 652 (1875).

Vitis flexuosa Thunb. f. *parvifolia* (Roxb.) Planch. in DC., Monogr. Phan. **5**: 348 (1887)–Franch., Pl. Delav. **1**: 137 (1889), ut var.

Balaju, Kathmandu, 1400 m (Sep. 23, 1963).

Distr. Himalaya (Kashmir to Nepal), Indo-China, and W. & S. China.

ELAEOCARPACEAE (by Takasi Tuyama)

Elaeocarpus lanceaefolius Roxb., Fl. Ind., ed. 2, **1**: 598 (1832)–Masters in Fl. Brit. Ind. **1**: 402 (1872)–Brandis, Ind. Tr. 102 (1906).

Takdah, 1600–1700 m (Apr. 18, 1960, no. 2107).

Distr. Temperate E. Himalaya (Sikkim, Bhutan), Khasia, Burma, and S. China (Kwangtung).

Glabrous or greyish hairy in the young parts. The petals fimbriate and pubescent at the base. The ovary 3-celled. The stamens ca. 25–29 in number, a little bearded at the apex. The specimen from Hong Kong in Herb. TI seems a little different in having coriaceous leaves.

Elaeocarpus sphaericus (Gaertn.) K. Schum. in Engl., Pfl.-fam. III, **6**: 5 (1890)–Corner in Gard. Bull. Str. Settl. Suppl. **10**: 326 (1939)–Merrill in Journ. Arn. Arb. **32**: 196 (1951).

Ganitrus sphaericus Gaertn., Fruct. et Sem. **2**: 271, pl. 139, fig. 6 (1791).

Elaeocarpus ganitrus Roxb. ex G. Don, Gen. Hist. **1**: 559 (1831)–Roxb., Fl. Ind. ed. 2, **2**: 592 (1832)–Masters, l.c. 400 (1874).

Dhankuta, 1200 m (Oct. 19, 1963); Illam, 1200 m (Dec. 7, 1963).

Distr. Malay Peninsula and Malay Archipelago including Philippines.

Our specimens were collected from cultivated trees for the use of their stones. The leaves are membranaceous, and thinly pilosulate beneath. The stone of nearly ripe fruits measures from 1.5 to 2.3 cm in diameter.

Elaeocarpus tectorius (Lour.) Poir. in Lam., Encycl. Méth. Suppl. **2**: 704 (1812)–Merrill, Interpr. Lour. Fl. Cochinch. 256 (1951).

Craspedum tectorium Lour., Fl. Cochinch. 336 (1790).

Elaeocarpus robustus Roxb., Fl. Ind. ed. 2. **2**: 597 (1832)–Masters, l.c. 402 (1874).

Gauriganja–Rangali, 200 m (Dec. 13, 1963).

Distr. Tropical E. Himalaya (Nepal, Sikkim), Khasia, Assam, Bengal, Burma, Indo-China, Malay Peninsula, and Sumatra.

There is another species of this genus that could not be determined yet. A short description of this one is as follows: The leaves 12–22 cm long, 3.5–7.0 cm wide, broadly oblong-lanceolate, and decurrent at the base with very short petiole. Glabrescent or ferrugineously pubescent in the young parts. The young drupe is ca. 2.1 cm long, pyriform, suddenly stipitately angustate at the base and finely pointed at the apex, and 1-seeded.

Sloanea sterculiaceus (Benth.) Rehder et Wilson in Pl. Wilson. **2**: 362 (1915).

Echinocarpus sterculiaceus Benth. in Journ. Linn. Soc. **5**, Suppl. **1**: 72 (1861)–Masters in Fl. Brit. Ind. **1**: 400 (1874)–Brandis, Ind. Tr. 101 (1906).

Ghorwa–Sanichare, 200 m, in ever green forest (Dec. 10, 1963, dehisc. fr.).

Distr. Tropical E. Himalaya (E. Nepal to Bhutan), S. Burma, and W. China (Yunnan).

The leaves are said by Bentham and Masters to be minutely serrulate, but in our specimen they look almost entire exept for very remote and apiculate terminals of the veinlets.

TILIACEAE (by Hiroo Kanai)

Corchorus aestuans L., Syst. Nat. ed. 10, **2**: 1079 (1759).

C. acutangulus Lam., Encycl. Méth. **2**: 104 (1786)–Fl. Brit. Ind. **1**: 398 (1874).

Dhara Pani–Dhankuta, cult., 800 m (Oct. 17, 1963, fr.).

Distr. Cultivated in tropics.

Corchorus capsularis L., Sp. Pl. ed. 1, 529 (1753)–Fl. Brit. Ind. **1**: 397 (1874).

Dhara Pani–Dhankuta, cult., 800 m (Oct. 17, 1963, fr.).

Distr. Cultivated in the tropics.

Corchorus olitorius L., Sp. Pl. ed. 1, 529 (1753)–Fl. Brit. Ind. **1**: 397 (1874).

Dhara Pani–Dhankuta, cult., 700 m (Oct. 17, 1963, fr.); Bharomdin–Tharpu, cult., 900 m (Nov. 25, 1963, fr.).

Distr. Cultivated in the tropics.

Grewia laevigata Vahl, Symb. Bot. **1**: 34 (1790)–Fl. Brit. Ind. **1**: 389 (1874).

Ghorwa–Sanichare, 300 m (Dec. 10, 1963, fr.).

Distr. Africa, Nepal, India, Burma, Malaya, Thai, and Australia.

Grewia multiflora Juss. in Ann. Mus. **4**: 89, t. 47, f. 1 (1804)–Fl. Brit. Ind. **1**: 388 (1874).

Dhankuta, 1200 m (Oct. 21, 1963, fr.); Illam–Ranga Pani, 1000 m (Dec. 8, 1963, fr.); Illam, 1200 m (Dec. 7, 1963, fr.).

Distr. E. Himalaya (Nepal, Sikkim), and Assam.

Grewia oppositifolia Hamilt. ex Roxb. [Hort. Beng. 42 (1814), nom. nud.] Fl. Ind. ed. 2, **1**: 583 (1832)–Fl. Brit. Ind. **1**: 384 (1874).

Swayambhu Nath, Kathmandu, 1400 m (Sep. 23, 1963, fr.); Phusri–Dhara Pani, 1000 m (Oct. 16, 1963, fr.).

Distr. Himalaya.

Triumfetta annua L., Mant. Pl. **1**: 73 (1767)–Fl. Brit. Ind. **1**: 396 (1874).

Kathmandu Airport, 1300 m (Oct. 13, 1963, fr.); Dhara Pani–Illam, 1300 m (Dec. 5, 1963, fr.).

Distr. Africa, Nepal, India, Burma, Thai, and Malay Archip.

Triumfetta Bartramia L., Syst. Nat. ed. 10, **2**: 1044 (1759)–Hara, Enum. Sperm. Jap. **3**: 144 (1954).

T. rhomboidea Jacq., Enum. Pl. Carib. 22 (1760)–Fl. Brit. Ind. **1**: 396 (1874).

Sanguri Bhanjang, 1100 m (Oct. 16, 1963, fl.); Phusri, 400 m (Oct. 16, 1963, fl.); Phusri–Dhara Pani, 500 m (Oct. 16, 1963, fr.); Dhara Pani–Dhankuta, 400 m (Oct. 17, 1963, fr.); Tuwa–Taplethok, 1300 m (Nov. 5, 1963, fr.); Illam, 1200 m (Dec. 7, 1963, fr.).

Distr. Africa, Nepal, India, Ceylon, Burma, Malaya, Thai, Indo-China, China, Formosa, Ryukyu, Philippines, and America.

Triumfetta pilosa Roth, Nov. Sp. 223 (1821)–Fl. Brit. Ind. **1**: 394 (1874).

Phusri–Dhara Pani, 300 m (Oct. 16, 1963, fl.); Dhankuta, 1200 m (Oct. 18, 1963, fr.); Ranga Pani–Ghorwa, 500 m (Dec. 9, 1963, fr.).

Distr. Africa, Nepal, India, Ceylon, Burma, Thai, and Indo-China.

MALVACEAE (by Hiroo Kanai)

Abutilon indicum (L.) Sweet, Hort. Brit. 54 (1827).

var. **populifolia** (Lam.) Wight et Arn., Prodr. **1**: 56 (1834)–Fl. Brit. Ind.

1: 326 (1874)–Hu, Fl. China, Malv. 33 (1955).

Sida populifolia Lam., Encycl. Méth. **1**: 7 (1783).

Biratnagar, 200 m (Oct. 14, 1963, fr.); Tamur Bridge, 300 m (Oct. 17, 1963, fr.).

Distr. Africa, Nepal, India, Burma, Thai, Indo-China, China, Formosa, Ryukyu, Bonin, Philippines, Indonesia, and Australia.

Hibiscus cannabinus L., Syst. Nat. ed. 10, **2**: 1149 (1759)–Fl. Brit. Ind. **1**: 339 (1874)–Hu, Fl. China, Malv. 58 (1955).

Sanichare–Sibganja, cult., 200 m (Dec. 11, 1963, fr.).

Distr. Introduced in the tropics. Native of India.

Hibiscus furcatus Roxb. [Hort. Beng. 51 (1814), nom. nud.] Fl. Ind. ed. 2, **3**: 204 (1832)–Fl. Brit. Ind. **1**: 335 (1874).

Dhara Pani–Tamur Bridge, cult., 800 m (Oct. 17, 1963, fr.).

Distr. Africa, India, Burma, Thai, Indo-China, and Malaya.

Hibiscus Manihot L., Sp. Pl. ed. 1, **2**: 696 (1753)–Fl. Brit. Ind. **1**: 341 (1874).

Abelmoschus Manihot (L.) Medicus, Malv. 46 (1787)–Hu, l.c. 35 (1955).

Dhankuta, 1200 m, cult., (Oct. 20, 1963, fr.); Ghatte–Khebang, cult., 1800 m (Nov. 19, 1963, fr.).

Distr. Native of China. Introduced into S.E. Asia.

var. **pungens** (Roxb.) Hochr. in Ann. Cons. Jard. Bot. Genèv. **4**: 155 (1900).

Hibiscus pungens Roxb. [Hort. Beng. 52 (1814), nom. nud.] Fl. Ind. ed. 2, **3**: 213 (1832).

Abelmoschus Manihot (L.) Medicus var. *pungens* (Roxb.) Hochr. in Candollea **2**: 87 (1924)–Hu, l.c. 35 (1955).

Gorzu Kosir–Dumhan, 1400 m (Oct. 30, 1963, fl. & fr.); Illam, 1200 m (Dec. 7, 1963, fr.).

Distr. Himalaya, Assam, Burma, and China.

Hibiscus mutabilis L., Sp. Pl. ed. 1, **2**: 694 (1753)–Fl. Brit. Ind. **1**: 344 (1874)–Hara, Enum. Sperm. Jap. **3**: 148 (1954)–Hu, l.c. 49 (1955).

Biratnagar, cult., 200 m (Dec. 19, 1963, fr.).

Distr. Native of China. Naturalized in India, Indo-China, Burma, and Japan.

Hibiscus rosa-sinensis L., Sp. Pl. ed. 1, **2**: 694 (1753)–Fl. Brit. Ind. **1**: 344 (1874)–Hu, l.c. 46 (1955).

Bharomdin–Tharpu, cult., 900 m (Nov. 25, 1963, fl.); Yektin, cult., 1400 m (Nov. 28, 1963, fl.).

Distr. Native of China. Introduced in the tropics.

Hibiscus Sabdariffa L., Sp. Pl. ed. 1, **2**: 695 (1753)–Fl. Brit. Ind. **1**: 340 (1874)–Hu, l.c. 58 (1955).

Nissim–Dumhan, cult., 1000 m (Oct. 30, 1963, fr.); Bharomdin–Tharpu, cult., 1000 m (Nov. 25, 1963, fr.); Birwa–Yektin, cult., 1400 m (Nov. 28, 1963, fr.).

Distr. Native of W. India. Cultivated in the tropics and temperates.

Hibiscus solandra L'Her., Stirp., **1**: 103, t. 49 (1788)–Fl. Brit. Ind. **1**: 336 (1874).

Phusri–Dhara Pani, 1000 m (Oct. 16, 1963, fr.); Sanguri Bhanjang, 1000 m (Oct. 16, 1963, fr.); Tamur Bridge–Dhankuta, 1000 m (Oct. 17, 1963, fr.).

Distr. Trop. Africa, India, Ceylon, and Burma.

Kydia jujubifolia Griff., Notul. **4**: 534 (1854); Icon. Pl. Asia. **4**: 595 (1854)–Hu, Fl. China, Malv. 72 (1955).

Dicellostyles jujubifolia (Griff.) Benth. in Gen. Pl. **1**: 207 (1862)–Fl. Brit. Ind. **1**: 333 (1874).

Yoksam–Bakkim, 1900 m (May 18, 1960, bud); Happy Valley, Darjeeling, 1900 m (Jun. 26, 1960, bud).

Distr. E. Himalaya (Sikkim, Bhutan).

Malva parviflora L., Amoen. Acad. **3**: 416 (1756)–Fl. Brit. Ind. **1**: 321 (1874).

Sibganja–Gauriganja, 200 m (Dec. 12, 1963, fr.).

Distr. Mediterranean region, and tropical Asia.

Malvaviscus arboreus Cav., Diss. 3, t. 48, f. 1 (1785).

Dhankuta, cult., 1200 m (Oct. 18, 1963, fl.).

Distr. Cultivated in tropics.

Sida acuta Burman f., Fl. Ind. 147 (1768)–Hara, Enum. Sperm. Jap. **3**: 150 (1954)–Hu, Fl. China, Malv. 18 (1955)–Hatusima in Journ. Jap. Bot. **35**: 362 (1960).

S. carpinifolia L. f. sensu Masters in Fl. Brit. Ind. **1**: 323 (1874).

Rayang, Darjeeling, 250 m (Apr. 23, 1960, fr.); Siliguri–Kurseong, 1000 m (Apr. 29, 1960, bud); Gangtok, 1700 m (Jun. 13 & 17, 1960, fr.); Phusri–Dhara Pani, 500 m (Oct. 16, 1963, fr.); Dhankuta, 1200 m (Oct. 20, 1963, fr.); Bharomdin–Tharpu, 800 m (Nov. 25, 1963, fr.); Dhara Pani–Illam, 1300 m (Dec. 5, 1963, fl.).

Distr. Tropics.

Sida cordifolia L., Sp. Pl. ed. 1, **2**: 684 (1753)–Fl. Brit. Ind. **1**: 324 (1874)–Hu, l.c. 15 (1955).

Phusri–Dhara Pani, 400 m (Oct. 16, 1963, fr.).

Distr. Tropics.

Sida multicaulis Cavan., Diss. **1**: 10, t. 1, f. 6 (1785)–Hu, l.c. 24 (1955).

S. humilis Cav., Diss. **5**: 277, t. 134, f. 2 (1788)–Fl. Brit. Ind. **1**: 322 (1874).

Nissim–Dumhan, 1000 m (Oct. 30, 1963, fl.).

Distr. Tropical Asia, Africa, and America.

Sida rhombifolia L., Sp. Pl. ed. 1, **2**: 684 (1753)–Fl. Brit. Ind. **1**: 323 (1874)–Hara, Enum. Sperm. Jap. **3**: 150 (1954)–Hu, l.c. 20 (1955)–Hatusima, l.c. 360 (1960).

Rayang, Darjeeling, 250 m (Apr. 23, 1960, fl. & fr.); Biratnagar, 200 m (Oct. 14, 1963, fr.); Phusri–Dhara Pani, 500 m (Oct. 16, 1963, fl.).

Distr. S. E. Asia.

Sida veronicaefolia Lam., Encycl. Méth. **1**: 5 (1783)–Hu, l.c. 23 (1955).

S. humilis Cav. var. *veronicaefolia* (Lam.) Masters in Fl. Brit. Ind. **1**: 322 (1874).

Phusri–Dhara Pani, 600 m (Oct. 16, 1963, fl.); Dhara Pani–Tamur Bridge, 500 m (Oct. 17, 1963, fl.); Dhara Pani–Illam, 1200 m (Dec. 5, 1963, fr.).

Distr. India, Burma, Indonesia, and China.

Thespesia Lampas (Cavan.) Dalz. et Gils., Bomb. Fl. 19 (1861)–Fl. Brit. Ind. **1**: 345 (1874)–Hu, Fl. China, Malv. 69 (1955).

Hibiscus Lampas Cavan., Diss. **3**: 154, t. 56, f. 2 (1785).

Dhara Pani–Tamur Bridge, 300 m (Oct. 17, 1963, fr.); Ranga Pani–Ghorwa, 400 m (Dec. 9, 1963, fr.).

Distr. Africa, India, Burma, Indo-China, China, and Malaysia.

Urena lobata L., Sp. Pl. ed. 1, **2**: 692 (1753)–Fl. Brit. Ind. **1**: 329 (1874)–Hara, Enum. Sperm. Jap. **3**: 151 (1954)–Hu, Fl. China, Malv. 73 (1955).

Balaju, Kathmandu, 1300 m (Sep. 23, 1963, fl.); Biratnagar, 200 m (Oct. 15, 1963, fr.); Sanguri Bhanjang, 1100 m (Oct. 16, 1963, fl.); Tamur Bridge–Dhankuta, 1000 m (Oct. 17, 1963, fr.).

Distr. Pantropic.

BOMBACACEAE (by Hiroo Kanai)

Bombax malabaricum DC., Prodr. **1**: 479 (1824)–Fl. Brit. Ind. **1**: 349 (1874).

Sanichare–Sibganja, 200 m (Dec. 11, 1963, young fr.); Sibganja–Mahara Bahara, 200 m (Dec. 12, 1963, young fr.).

Distr. Tropical Himalaya, India, Ceylon, Burma, Indo-China, W. China (Yunnan), Java, and Sumatra.

STERCULIACEAE (by Hiroo Kanai)

Abroma augusta (L.) L. f., Suppl. Pl. 341 (1781)–Fl. Brit. Ind. **1**: 375 (1874)–Gagnep. in Fl. Gén. Ind.-Chin. **1**: 513 (1911).

Theobroma augusta L., Syst. Nat. ed. 12, 233 (1770).

Dhara Pani–Tamur Bridge, 400 m (Oct. 17, 1963, fr.).

Distr. Nepal, India, Burma, Thai, Indo-China, China, Micronesia, Bonin, and Malaysia.

Melochia corchorifolia L., Sp. Pl. ed. 1, **2**: 675 (1753)–Fl. Brit. Ind. **1**: 374 (1874)–Hara, Enum. Sperm. Jap. **3**: 154 (1954).

Biratnagar, 200 m (Oct. 14, 1963, fr.); Phusri–Sanguri Bhanjang, 600 m (Oct. 16, 1963, fr.); Dhara Pani–Tamur Bridge, 500 m (Oct. 17, 1963, fr.).

Distr. Pantropic.

DILLENIACEAE (by Hiroshi Hara)

Dillenia indica L., Sp. Pl. ed. 1, **1**: 535 (1753)–Fl. Brit. Ind. **1**: 36 (1872)–Hoogland in Blumea **7**: 108 (1952).

Ghorwa–Sanichare, 250–200 m (Dec. 10, 1963).

Distr. Subtropical Himalaya, India south to Ceylon, Burma, Thai, Indo-China, Malaysia, and S. China (Yunnan).

Dillenia pentagyna Roxburgh, Pl. Corom. **1**: 21, t. 20 (1795)–Fl. Brit. Ind. **1**: 38 (1872)–Hoogland, l.c. 117 (1952).

Loohya Mai–Ghorwa, 400–300 m (Dec. 9, 1963).

Distr. Subtropical Himalaya, India south to Deccan Penin., Burma, Thai, Indo-China, Malay Archip. (Java, Lesser Sunda, S. Celebes), and S. China (Yunnan, Hainan).

ACTINIDIACEAE (by Hiroshi Hara)

Actinidia callosa Lindley, Nat. Syst. ed. 2, 439 (1836)–Fl. Brit. Ind. **1**: 286 (1874)–Dunn in Journ. Linn. Soc. **39**: 405 (1911), var. *typica*–Li in Journ. Arn.

Arb. **33**: 45 (1952), var. *callosa.*

Taplejung, 1900 m (Nov. 2, 1963, fr.); Taplethok–Helok, 1500 m (Nov. 6, 1963, fr.); Zongi–Iladanda (Nov. 12, 1963, fr.); Yamphodin–Ghatte, 2200 m (Nov. 16, 1963, fr.).

Distr. sp. Himalaya (Garhwal to Sikkim), Assam, N. Burma, Indo-China (Tonkin), Malaysia, and W. & C. China.

Actinidia strigosa Hook. f. et Thoms. ex Bentham in Journ. Linn. Soc. **5**: 55 (1861)–Fl. Brit. Ind. **1**: 286 (1874)–Li, l.c. 13 (1952).

Chia Bhanjang–Dentam, 3100–1400m (May 11, 1960, bud); Ramam, 2400m (May 8, 1960); Sandakphu–Garibans, 3000–2800 m (Jun. 7, 1960, fl.); Bilbatay Bhanjang–Hati Sar, 2400–3000 m (Oct. 27, 1963, fr.); Minchin Dhap–Mul Pokhari, 3000–2500 m (Oct. 29, 1963).

Distr. E. Himalaya (Nepal, Sikkim).

Saurauia fasciculata Wallich, Pl. Asia. Rar. **2**: 40, t. 148 (1831)–Fl. Brit. Ind. **1**: 287 (1874).

Below Gangtok, 1000 m (Jun. 16, 1960, fl.), det. Tuyama.

Distr. Himalaya (Nepal, Sikkim).

Saurauia napaulensis DC., Mém. Ternstr. 29 (1822)–Wallich, Pl. Asia. Rar. **2**: 40, 77, t. 178 (1831)–Fl. Brit. Ind. **1**: 286 (1874).

Takdah, 1600 m (Apr. 19, 1960, bud); Palmajua–Rimbick, 1500–2200 m (May 5, 1960, no. 95, fl.); Sunderijal, 1600 m (Sep. 20, 1963, fl.); Dumhan–Taplejung, 1100 m (Nov. 1, 1963, fl.); Taplejung, 1900 m (Nov. 2, 1963, fl.); Taplejung–Garhi Danra, 1900–2200 m (Nov. 3, 1963, fl.); Taplethok–Helok, 1400–1500 m (Nov. 6, 1963, fr.); Khebang, 1700 m (Nov. 19, 1963, fl.).

Distr. Himalaya (Garhwal to Bhutan), Khasia, Mishmi Hills, N. Burma, Indo-China, and W. China (Yunnan, Szechuan, Kweichow).

The trees are often planted around villages, and the leaves are used as fodder for cattle.

THEACEAE (by Hiroshi Hara)

Camellia Kissi Wallich in Asiat. Research. **13**: 429 (1820); Pl. Asia. Rar. **3**: t. 256 (1832)–Sealy in Revis. Camellia 197, f. 91 (1958).

C. drupifera Loureiro sensu Fl. Brit. Ind. **1**: 293 (1874).

Pamianchi–Gayzing Bazar, 1600–1800 m (May 13 & 14, 1960, no. 251, fr.); Tingling Bridge–Yoksam, 1000–1700 m (May 16, 1960, no. 291 & 293, fr.); Sunderijal Waterfall, Kathmandu, 1600 m (Sep. 20, 1963); Pouwa, Kathmandu, 1600 m (Oct. 9, 1963, fl.); below Taplejung, 1800 m (Oct. 31 & Nov. 2, 1963, fl., fr.); Garhi Danra, 2200 m (Nov. 3, 1963, fl.); Yamphodin–Ghatte, 1700m (Nov. 16, 1963, fl.); Ghatte–Khebang, 2400–1600 m (Nov. 19, 1963, fr.); Khebang–Bharomdin, 1700–1000 m (Nov. 24, 1963, fl.); Khunga–Yektin, 2000–1600 m (Nov. 28, 1963, fl.); Akasay–Batasay, 2000–2400 m (Nov. 30, 1963, fl.).

Distr. E. Himalaya (Nepal to NEFA), Khasia, Naga Hills, Manipur, N. Burma, Indo-China, and W. & S. China.

This species is allied to *Camellia Sasanqua* Thunberg of south Japan.

Camellia sinensis (L.) O. Kuntze in Act. Hort. Petrop. **10**: 195 (1887), in obs.–Kitamura in Act. Phytotax. Geobot. **14**: 56 (1950)–Sealy, l.c. 112, f. 53 (1958).

Thea sinensis L., Sp. Pl. ed. 1, **1**: 515 (1753)–Hara, Enum. Sperm. Jap. **3**: 171

(1954).

Thea bohea L., Sp. Pl. ed. 2, **1**: 734 (1762).

var. **sinensis**.

Below Takdah, cult., 1500–1200 m (Apr. 20, 1960); Peshok, cult., 900 m (Apr. 27, 1960, fr.); Darjeeling, cult., 2100 m (Jun. 26, 1960, fr.); Iladanda–Helok, 1800–1500 m (Nov. 13, 1963, fl.); Illam, cult., 1200 m (Dec. 7, 1963, fl.); Loohya Mai–Ghorwa, escaped?, 500–300 m (Dec. 9, 1963, fl.).

var. **assamica** (Masters) Kitamura in Act. Phytotax. Geobot. **14**: 59 (1950)–Sealy, l.c. 119, f. 55 (1958).

Thea assamica Masters in Journ. Agr. & Hort. Soc. Ind. **3**: 63 (1844).

Camellia theifera Griffith, Notul. **4**: 558 (1854); Icon. Pl. Asia. t. 601, f. 1, 3 (1854)-Fl. Brit. Ind. **1**: 292 (1874).

C. assamica (Mast.) W. Wight in Curr. Sci. **31**: 299 (1962).

Below Takdah, cult., 1500–1200 m (Apr. 20, 1960).

Distr. sp. Assam, N. Burma, Thai, Indo-China, W. & S. China, and Formosa.

The tea-plant cultivated in tea-gardens around Darjeeling mostly belongs to *C. sinensis* var. *sinensis*, but it is variable in the size and hairiness of leaves, and some plants with small leaves are referrable to f. *parvifolia* (Miquel) Sealy. Mixed with var. *sinensis*, var. *assamica* having much larger thinner leaves with acuminate apex and midrib hairy beneath is also found here and there, and intermediate forms probably of hybrid origin between the two varieties are not uncommon.

Eurya acuminata DC., Mém. Ternstr. 26 (1822); Prodr. **1**: 525 (1824)–Fl. Brit. Ind. **1**: 285 (1874)–Kobuski in Ann. Miss. Bot. Gard. **25**: 321 (1938), p.p.

E. multiflora DC., l.c. 25 (1822); l.c. (1824).

Diospyros serrata Hamilt. ex D. Don, Prodr. Fl. Nepal. 143 (1825).

Takdah, 1600–1700 m (Apr. 19, 1960, no. 1960, fl.); Ghum–Kurseong, 1700 m (Jun. 22, 1960); Gangtok, 1650 m (Apr. 26 & Jun. 13, 1960); Damthang–Tendong, 2300 m (Mar. 26, 1963, defl.); Godavari, Kathmandu, 1500 m (Sep. 18, 1963, fl.); Minchin Dhap–Mul Pokhari, 2900–2500 m (Oct. 29, 1963, fl.); Gorzu Kosir–Nissim, 1400 m (Oct. 30, 1963, fl.); Taplejung–Garhi Danra, 1900–2200 m (Nov. 3, 1963, fl.); Garhi Danra–Tuwa, 2200–1800 m (Nov. 4, 1963, fl.); Helok–Baroya Khimty, 1500–2500 m (Nov. 10 & 15, 1963, fl.); Birwa–Yektin, 2900–2000 m (Nov. 28, 1963, fl., fr.).

Distr. Himalaya (Kumaon to Bhutan), Assam, Manipur, Ceylon, Burma, Thai, Indo-China and Malaysia.

Typical *Eurya acuminata* of Himalayas has villose young branches and petioles with spreading long thin hairs, minutely serrate leaves caudate-acuminate at the apex and hirsute on midrib beneath, and deeply trifid styles about 2 mm long. The plants of Formosa referred to *E. acuminata* generally belong to *E. Loquaiana* Dunn, and those from southernmost Japan and Ryukyu mostly to *E. pubicalyx* Ohwi (*E. japonica* f. *australis* Hatusima). *E. japonica* Thunberg of Japan and S. Korea has almost terete glabrous branches, obtusely serrate glabrous leaves shortly acuminate with an obtuse tip, leaf veins not impressed above, and styles about 1 mm long and trifid in the upper part.

Eurya cavinervis Vesque in Bull. Soc. Bot. France **42**: 158 (1895)–Kobuski in Journ. Arn. Arb. **20**: 363 (1939)–Chang in Act. Phytotax. Sin. **3**: 49 (1954).

E. japonica Thunb. var. *Thunbergii* Thw. sensu Fl. Brit. Ind. **1**: 284 (1874), p.p. *E. Handeliana* Kobuski in Ann. Miss. Bot. Gard. **25**: 309 (1938).

Preig Chu-Jongri, 3000 m (May 19, 1960, no. 393, fl.).

Distr. E. Himalaya (Sikkim), Khasia?, N. Burma, and W. China (Yunnan).

In our specimens the leaves are longer acuminate than the type.

Eurya cerasifolia (D. Don) Kobuski in Ann. Miss. Bot. Gard. **25**: 326 (1938)–Chang, l.c. 32 (1954).

Diospyros cerasifolia D. Don, Prodr. Fl. Nepal. 144 (1825).

E. symplocina Blume, Mus. Bot. Lugd.-Bat. **2**: 133 (1856)–Fl. Brit. Ind. **1**: 284 (1874).

Takdah, 1600–1700m (Apr. 19, 1960, no. 2121, fr.); Rimbick, 2200m (May 6, 1960, fl.); Mul Pokhari–Nissim, 1400–1700 m (Oct. 30, 1963, fl.); Taplejung–Garhi Danra, 1900–2200 m (Nov. 3, 1963, fl., fr.); Ghatte–Khebang, 1600–2400 m (Nov. 19, 1963, fl., fr.); Yektin–Akasay, 1600–2300 m (Nov. 30, 1963, fr.); Mai Majuwa–Dhara Pani, 1900–1500 m (Dec. 4, 1963, fl.).

Distr. E. Himalaya (Nepal to Bhutan), Assam, Manipur, Burma, and W. China (Yunnan).

Schima Wallichii (DC.) Korthals in Temminck, Verh. Nat. Ges. Bot. 143 (1839–42)–Fl. Brit. Ind. **1**: 289 (1874)–Bloembergen in Reinwardt. **2**: 136 & 163 (1952), subsp. *Wallichii* var. *Wallichii*.

Gordonia Wallichii DC., Prodr. **1**: 528 (1824).

Takdah, 1700 m (Apr. 19, 1960, no. 2125, bud); Takdah–Rayang, 1000 m (Apr. 20, 1960, no. 2192, bud); Gangtok, 1600 m (Apr. 26, 1960); Siliguri–Kurseong, 1200 m (Apr. 29, 1960, fl.); Dentam, 1400 m (May 11, 1960, no. 207, fl.); Pamianchi–Tingling Bridge, 2000–1000 m (May 15, 1960, fl.); Kathmandu, 1500 m (Oct. 13, 1963, young fr.); Sanguri Bhanjang, 1200m (Oct. 16, 1963, young fr.); Dumhan–Taplejung, 900m (Nov. 1, 1963, fr.); Dhara Pani–Illam, 1500–1200 m (Dec. 5, 1963, fr.).

Distr. E. Himalaya (Nepal to Bhutan), Assam, S. Tibet, Manipur, Burma, Thai, and W. China.

HYPERICACEAE (by Yojiro Kimura)

Hypericum elodeoides Choisy in DC., Prodr. **1**: 552 (1824)–Thiselton Dyer in Fl. Brit. Ind. **1**: 255 (1874).

Kakani, 2100 m (Sep. 24, 1963); Murhay–Sinduwa, 2100 m (Oct. 23 & 24, 1963); Bilbatay Bhanjang, 2200 m (Oct. 26, 1963); Bilbatay Bhanjang–Hati Sar, 2200–2900 m (Oct. 27, 1963); Hati Sar–Minchin Dhap, 2700–2900m (Oct. 28, 1963); Minchin Dhap–Mul Pokhari, 2900–2500 m (Oct. 29, 1963); Walunchung Gola–Zongi (Nov. 11, 1963); Baroya Khimty, 2500 m (Nov. 11, 1963); Baroya Khimty–Thakma Khola, 2500–3200 m (Nov. 12 & 16, 1963); below Siling Tzokupa (Nov. 21, 1963).

Distr. Nepal, Sikkim, Khasia, and Burma.

Very characteristic, having glandular-fringed sepals and bases of bracts.

Hypericum humifusum L., Sp. Pl. ed. 1, **2**: 785 (1753)–T. Dyer, l.c. 255 (1874).

Chia Bhanjang–Phalut, 3550m (Jun. 2, 1960); Birch Hill, Darjeeling, 2000m (Jun. 18, 1960); Senchal–Tiger Hill, 2400–2500 m (Jun. 23, 1960); Lagyap, 2200 m (Sep. 12, 1964).

Distr. Europe, Sikkim, and Nilghiris.

Norysca Hookeriana (Wight et Arnott) Wight, Ill. Ind. Bot. **1**: 113 (1840)-Y. Kimura, Hyperic. in Nova Fl. Jap. **10**: 98 (1951).

Hypericum Hookerianum Wight et Arnott, Prodr. Fl. Ind. Or. **1**: 99 (1834).

Hypericum oblongifolium Choisy sensu Hooker f. in Bot. Mag. t. 4949 (1856).

var. **Hookeriana.**

Sepala ovata vel orbiculato-ovata, apice obtusa sed mucronulato-acuta.

Ghum–Kurseong, 2000 m (Jun. 20, 1960); Senchal–Tiger Hill, 2400–2500 m (Jun. 23, 1960); Minchin Dhap–Mul Pokhari, 2900–2500 m (Oct. 29, 1963); Walunchung Gola–Zongi, 2800–3800 m (Nov. 11, 1963); Baroya Khimty–Thakma Khola (Nov. 12 & 16, 1963); Thakma Khola–Bhandukay, 2500–3500 m (Nov. 14, 1963); below Siling Tzokupa–Siling Tzokupa, 2100–3100 m (Nov. 21, 1963); Bhuspate Danra, 2600 m (Dec. 2, 1963); Darjeeling, 2100 m (Sep. 16, 1964); Gatribas–Tonglu, 2800–3000 m (Sep. 19, 1964).

Distr. E. Himalaya (Nepal, Sikkim), Khasia, and Mishmi Hills.

var. **Leschenaultii** (Choisy) Y. Kimura, comb. nov.

Hypericum Leschenaultii Choisy in DC., Prodr. **1**: 545 (1824)–Stapf in Bot. Mag. t. 9160 (1928).

Norysca Leschenaultii (Choisy) Blume, Mus. Bot. Lugd.-Bat. **2**: 24 (1852).

Hypericum Hookeriana var. *Leschenaultii* (Choisy) Dyer, l.c. 254 (1874).

Sepala lanceolata vel obovato-lanceolata, apice acuminata basi attenuata.

Sandakphu–Garibans, 2800 m (Jun. 7, 1960); Bilbatay Bhanjang–Hati Sar, 2400–2900 m (Oct. 27, 1963); Hati Sar–Minchin Dhap, 2700–2900 m (Oct. 28, 1963).

Distr. E. Himalaya (Nepal, Sikkim), Java?, and Sumatra?.

In the Illustr. of Ind. Bot., Wight did not take the name *Norysca Hookeriana*, but he noted as follows: To this genus our *Hypericum mysorense*, Prodr. **1**: 99, belongs (*Norysca mysorensis*, Wight's Icon. no. 56. *N. myrtifolia?* Spach) and *H. Hookerianum*, perhaps also several of the Himalayan species.

Norysca Urala (Hamilt.) K. Koch, Hort. Dendr. 66 (1853)–Y. Kimura, l.c. 102 (1951).

Hypericum Uralum Hamilton ex D. Don in Bot. Mag. t. 2375 (1823).

H. patulum Thunb. sensu Dyer, l.c. 254 (1874).

H. patulum var. *Uralum* (Don) Koehne, Deuts. Dendr. 415 (1893)–Rehder, Man. ed. 2, 638 (1940).

var. **Urala.**

Batasi–Palmajua, 2300–2600 m (May 3, 1960); Palmajua–Rimbick, 2000 m (May 5, 1960); Gangtok, 1600 m (Jun. 3 & 15, 1960); Darjeeling, 2000–2200 m (Jun. 11, 18 & 23, 1960; Dec. 28, 1963); Ghum, 2300 m (Jun. 19, 1960); Pouwa, Kathmandu, 1600 m (Oct. 9, 1963); Sinduwa, 2100 m (Oct. 23, 1963); Hati Sar–Minchin Dhap, 2700–2900 m (Oct. 28, 1963); Bilbatay Bhanjang–Hati Sar, 2200–2900 m (Oct. 27, 1963); Taplejung–Garhi Danra, 1900–2200 m (Nov. 3, 1963); Selap–Walunchung Gola, 2600–3800 m (Nov. 10 & 11, 1963); Baroya Khimty–Thakma Khola (Nov. 12, 1963); Bhandukay–Yamphodin, 2500–2100 m (Nov. 16 & 17, 1963); Birwa–Yektin, 1600–2400 m (Nov. 28, 1963).

var. **angustifolia** Y. Kimura, var. nov.

Folia lanceolata, 20-30-45 mm longa 5-8-10 mm lata, apice acuta, saepe inflorescentia multiflora.

Sunderijal Waterfall, Kathmandu, 1600 m (Sep. 20, 1963); Murhay, 2000 m (Oct. 23, 1963); Sinduwa, 2100 m (Oct. 23, 1963); Helok, 1500 m (Nov. 9, 1963); Ilandanda-Selap, 1800–2600 m (Nov. 9, 1963); Helok–Baroya Khimty, 1500–2500 m (Nov. 10, 1963); Zongi–Iladanda (Nov. 12, 1963); Ghatte, 1600 m (Nov. 17, 1963); Yamphodin–Ghatte, 2100–1600 m (Nov. 18, 1963—Typus var. *angustifoliae* in TI); Batasay–Halhale Bhanjang, 2400–2700 m (Dec. 1, 1963); Mai Majuwa–Dhara Pani, 1500–1900 m (Dec. 4, 1963).

Distr. sp. Himalaya, and Khasia.

Norysca Urala is closely allied to *Norysca patula* (Thunb.) Blume, which is cultivated in Japan, but is distinguishable by its slender branches, its smaller flowers, and its shorter stamens than the pistil.

Sarothra laxa (Blume) Y. Kimura, Hyperic. l.c. 241 (1951).

Hypericum japonicum Thunb. sensu Royle, Ill. Bot. Himal. 131, t. 24, fig. 2 (1834)-Dyer, l.c. 256 (1874).

Brathys laxa Blume, Mus. Bot. Lugd.-Bat. **2**: 19 (1856).

Hypericum laxum (Bl.) Koidzumi in Bot. Mag. Tokyo **40**: 344 (1926).

Kalimpong, 1400 m (Apr. 23, 1960; Jun. 20, 1960); Rayang, 250 m (Apr. 20, 1960); Palmajua–Rimbick (May 5, 1960); Gangtok, 1500 m (Jun. 3 & 15, 1960); Penlong La, 2100m (Jun. 16, 1960); Saramsa Medicinal Garden (Jun. 17, 1960); Godavari, south of Kathmandu, 1500 m (Sep. 18, 1963); Kathmandu, 1400 m (Oct. 13, 1963); Murhay–Sinduwa, 2000–2100 m (Oct. 22 & 24, 1963); Tharpu–Chyangthaphu, 1200–1300m (Oct. 26, 1963); Minchin Dhap–Mul Pokhari, 2900–2500 m (Oct. 29, 1963); Dumhan, Taplejung, 700 m (Oct. 31, 1963); below Siling Tzokupa–Khebang, 2100–1700 m (Nov. 22, 1963); Bharomdin–Tharpu, 900–1200 m (Nov. 25, 1963).

Distr. E. Himalaya (Nepal Sikkim), Khasia, China, Japan (Hokkaido to Okinawa), Korea, Java, Australia, and New Zealand.

DIPTEROCARPACEAE (by Hiroo Kanai)

Shorea robusta Gaertn. f., Fruct. et Sem. **3**: 48 t. 186 (1805)–Fl. Brit. Ind. **1**: 306 (1874)–Gilg in Engl., Pfl.-fam. ed. 2, **21**: 260 (1925).

Siliguri–Kurseong, 700 m (Apr. 29, 1960, fr.); Tista, 500 m (Jun. 19, 1960, fr.); Dumhan, 800 m (Oct. 31, 1963); Bharomdin–Tharpu, 700 m (Nov. 25, 1963); Ranga Pani, 700 m (Dec. 8, 1963,); Ranga Pani–Loohya Mai, 600 m (Dec. 9, 1963); Ranga Pani–Sanichare, 300 m (Dec. 9, 1963).

Distr. Himalaya (Garhwal to Assam), and India.

TAMARICACEAE (by Hiroshi Hara)

Myricaria germanica Desv. in Ann. Sci. Nat. ser. 1, **4**: 349 (1825).

var. **prostrata** (Benth. et Hook. f.) T. Dyer in Fl. Brit. Ind. **1**: 250 (1874)–Spring Fl. Sikkim Himal. f. 20 (1963).

M. prostrata Benth. et Hook. f., Gen. Pl. **1**: 161 (1862).

Jongri–Preig Chu, 3600 m, along rivers (May 23, 1960, no. 449, fl.).

Distr. Himalaya (Kumaon to Sikkim).

Tamarix dioica Roxburgh, Fl. Ind. ed. 2, **2**: 101 (1832), ut *dioeca*–Fl. Brit. Ind. **1**: 249 (1874).

Gauriganja–Rangali, 200 m, along rivers (Dec. 13, 1963, fr.); Mahara Bahara–Kathgara, 200 m (Dec. 13, 1963, fr.); Kathgara–Rangali, 200 m (Dec. 14, 1963, fr.).

Distr. Tropical Himalaya, India, and Burma.

VIOLACEAE (by Hiroshi Hara)

Viola biflora L., Sp. Pl. ed. 1, **2**: 936 (1753)–Fl. Brit. Ind. **1**: 182 (1872)–W. Becker in Beih. Bot. Centralbl. Abt. 2, **36**: 39 (1918)–Hara, Enum. Sperm. Jap. **3**: 196 (1954)–Weibel in Candollea **16**: 195 (1958).

V. manaslensis F. Maekawa in Act. Phytotax. Geobot. **15**: 173 (1954); in Faun. & Fl. Nepal Himal. 181, f. 37 (1955).

Jongri–Gamothang, 4100–3800 m (May 26, 1960, no. 554, fl.); Gamothang, 3800 m (May 29, 1960, fl.); Migothang, 3800 m (May 31, 1960, fl.); Mt. Singalila, 3600 m (Jun. 2, 1960, fl.); Phalut, 3500 m (Jun. 5, 1960, fl.).

Distr. Eruope, Siberia, C. Asia, Himalaya (Kashmir to NEFA), W. & N. China, N. Korea, Japan south to Kyushu, and N. America (Alaska, Yukon, Colorado).

Our collections have generally deep yellow flowers often purplish brown outside, upper petals 3–4 mm wide, and broad lips 6–7 mm wide, subtruncate at the apex, and with 5–7 black-purple veins. But the plants on Mt. Singalila have smaller flowers, oblong petals about 2 mm wide, and acutish lips about 3.5 mm wide.

Viola cameleo Boissieu in Bull. Herb. Boiss. ser. 2, **1**: 1074 (1901)–W. Becker, l.c. **36**: 45 (1918).

Bakkim–Jongri, 3000–4000 m (May 19, 1960, no. 372, fl.).

Distr. E. Himalaya (Sikkim), and W. China (Szechuan).

The species is new to Eastern Himalaya. It differs from *V. biflora* L. by ovate-cordate leaves long acuminate at the apex, actue stipules, and longer spurs 2–3 mm long. Our specimen matches well with the type specimen of *V. cameleo* in Mus. Paris collected at Tchen-keou-lin, Sutchuen by Farges.

Viola diffusa Gingins in DC., Prodr. **1**: 298 (1824)–Fl. Brit. Ind. **1**: 183 (1872)–W. Becker, l.c. **40**: 114 (1920).

Darjeeling, 2000 m (Apr. 1, 1960, fl.); Takdah, 1600 m (Apr. 18, 1960, no. 1974, fr.); Yoksam, 1700 m (May 17, 1960, fr.); Gangtok, 1600 m (Jun. 15, 1960, fr.); Helok, 1500 m (Nov. 9, 1963); Khebang, 1400 m (Nov. 20 & 22, 1963, fr.); Chyangthaphu–Birwa, 1300–2400 m (Nov. 27, 1963, fr.).

Distr. sp. Himalaya (Nepal to Bhutan), Khasia, Naga Hills, Burma, Indo-China, China, Formosa, S. Japan, and Malaysia.

The Japanese plants, var. *glabella* Boissieu (cf. Hara, Enum. Sperm. Jap. **3**: 199, 1954), are generally less hairy than the Himalayan ones.

Viola glaucescens Oudemans in Miq., Ann. Mus. Bot. Lugd.-Bat. **3**: 74 (1867)–W. Becker, l.c. **34**: 258 (1916); **40**: 109 (1920).

Darjeeling, 2000 m (Apr. 1, 2 & Jun. 18, 1960, fl., fr.); Senchal, 2300 m (Apr. 6, 1960, fl.); Kurseong, 1550 m (Apr. 11, 1960, no. 792 p.p., fl.); Takdah, 1700 m (Apr. 19, 1960, no. 1954, fl.); Mani Bhanjang–Batasi, 2000–2100 m (May 1, 1960, fl.); Batasi–Palmajua, 2300–2600 m (May 3, 1960, no. 75, fl.); Rimbick–Ramam, 1900–2400 m (May 7, 1960, no. 100 p.p., fl.); Tendong Peak, 2700 m (Mar. 26, 1963, fl.); Sinduwa, 2100 m (Oct. 24, 1963, fr.); Batasay–Bhuspate Danra, 2400–2800 m (Dec. 1, 1963, fr.).

Distr. E. Himalaya (Nepal, Sikkim).

The flowers are variable in size and colour. At Senchal, some plants have smaller white flowers about 1 cm in diameter, while some have larger rose-purple flowers attaining 1.5 cm in diameter (f. *rubella* (W. Beck.) Hara, comb. nov.—*V. glaucescens* var. *rubella* W. Beck., l.c. 259, 1916), but interconnecting forms between the two are also found.

Viola Hookeri Thomson in Fl. Brit. Ind. **1**: 183 (1872), p.p.-W. Becker, l.c. **34**: 259 (1916)-Spare et Fischer in Kew Bull. **1929**: 251 (1929).

Phalut-Chia Bhanjang, 3600–3100 m (May 11, 1960, fl.); Bakkim, 2200 m (May 18, 1960, fr.); Bakkim-Jongri, 2500–4000 m (May 19, 1960, no. 398, fl.); Minchin Dhap-Mul Pokhari, 2900–2500 m (Oct. 29, 1963, fr.); Diorali Bhanjang-Bhandukay, 3500–2500 m (Nov. 14 & 17, 1963, fr.); Birwa-Yektin, 2900–2000 m (Nov. 28, 1963, fr.).

Distr. Himalaya (E. Nepal to NEFA).

Viola inconspicua Blume, Cat. Buitenz. 57 (1823); Bijdr. **1**: 58 (1825)-W. Becker in Engl., Bot. Jahrb. **54** (Beibl. 120): 167 & 173 (1917).

V. apetala (non F. W. Schmidt 1791) Roxb., Fl. Ind. ed. Carey, **2**: 449 (1824).

V. Patrinii DC. sensu Hook. f., Fl. Brit. Ind. **1**: 183 (1872), p.p.

Kalimpong, 1300 m (Apr. 23, 1960, fr.); Dumhan, 700m (Oct. 31, 1960, fr.); Helok, 1500 m (Nov. 7, 1963, fr.).

Distr. E. Himalaya, Khasia, Naga Hills, Burma, China, and Malaysia.

Viola serpens Wallich in Roxb., Fl. Ind. ed. Carey, **2**: 449 (1824)-DC., Prodr. **1**: 296 (1824)-Royle, Ill. Bot. Himal. t. 18, f. 1 (1834)-Fl. Brit. Ind. **1**: 184 (1872)-W. Becker, l.c. **34**: 255 (1916); **40**: 103 (1920).

Kalimpong, 1300 m (Apr. 23, 1960, fl., fr.); Mani Bhanjang-Batasi, 2000–2100 m (May 1, 1960, no. 11, fl.); Palmajua-Rimbick, 2300–2200 m (May 5, 1960, fl., fr.); Ramam-Phalut, 2400–3500 m (May 9, 1960, fl.); Phalut-Chia Bhanjang, 3300 m (May 11, 1960, no. 198, fl.); Yoksam-Bakkim, 1700–2200 m (May 18, 1960, no. 351, fr.); Bakkim, 2800m (May 19, 1960, fl.); Baroya Khimty-Thakma Khola, 2500–3200m (Nov. 12, 1963).

Distr. E. Afghanistan, Himalaya (Kashmir to Sikkim), Khasia, Naga Hills, Manipur, Burma, Thai, and W. China.

The *Viola serpens* group including *V. Thomsoni*, *V. glaucescens*, *V. Hookeri* and *V. sikkimensis* is well differentiated in Himalayas, and is very polymorphous.

The specimens cited above from Yoksam-Bakkim, and Mani Bhanjang-Batasi have sparsely hairy leaves with a long caudate-acuminate apex. The specimen from Phalut-Chia Bhanjang agrees with the description of *V. placida* W. Becker, and it seems to be only a smaller form of *V. serpens*.

Viola sikkimensis W. Becker, l.c. **34**: 260 (1916).

V. Hookeri Thomson, l.c. 183 (1872), p.p.

Kurseong, 1550 m (Apr. 12, 1960, no. 792 p.p., fl.); Palmajua-Rimbick, 2300–2200 m (May 5, 1960, fl.); Rimbick-Ramam, 1900–2400 m (May 7, 1960, no. 100 p.p., fl.).

Distr. E. Himalaya (Sikkim), Khasia, Naga Hills, Burma, and W. China.

Viola Thomsoni Oudemans in Miq., Ann. Mus. Bot. Lugd.-Bat. **3**: 74 (1867)-W. Becker, l.c. **34**: 257 (1916); **40**: 107 (1920).

Birch Hill, Darjeeling, 2000 m (Apr. 1 & 5, 1960, fl.; Mar. 16, 1963, fl.); Kurseong, 1600m (Apr. 12, 1960, fl.); Mani Bhanjang–Batasi, 2000–2100m (May 1, 1960, no. 20 & 11, fl., fr.); Batasi–Palmajua, 2100–2300 m (May 3, 1960, no. 48 & 81, fl.); Ramam, 2400 m (May 8, 1960, fl.); Yoksam, 1700 m (May 17, 1960, fl., fr.); Rabong La–Temi, 2100–1600 m (Mar. 28, 1963, fl.); Mul Pokhari–Gorzu Kosir, 2500–2100 m (Oct. 30, 1963, fr.); Birwa–Yektin, 2900–1600 m (Nov. 28, 1963, fr.).

Distr. E. Himalaya (Nepal to Bhutan), Manipur, and Burma.

FLACOURTIACEAE (by Hiroshi Hara)

Homalium napaulense (DC.) Bentham in Journ. Linn. Soc. **4**: 34 (1860), ut *nepalense*–Fl. Brit. Ind. **2**: 596 (1879).

Blackwellia napaulensis DC., Prodr. **2**: 54 (1825)–Wall., Pl. Asia. Rar. **2**: 77, t. 179 (1831).

Chobar Gorge, Kathmandu, 1200 m (Sep. 21, 1963, fl.); Khebang–below Siling Tzokupa, 1700–2100 m (Nov. 20, 1963, fl.); Khebang–Bharomdin, 1700–1000m (Nov. 24, 1963, fl.); below Yektin, 1400 m (Nov. 29, 1963, fl.).

Distr. E. Himalaya (Nepal).

STACHYURACEAE (by Hiroshi Hara)

Stachyurus himalaicus Hooker f. et Thomson ex Bentham in Journ. Linn. Soc. **5**: 55 (1861), in adnota–Fl. Brit. Ind. **1**: 288 (1874)–Li in Bull. Torrey Bot. Cl. **70**: 621 (1943).

Ramam, 2400 m (May 8, 1960, defl.); Pamianchi–Tingling Bridge, 2000–1000 m (May 15 & 16, 1960, fr.); Yoksam–Bakkim, 1700–2000 m (May 18, 1960); Garibans–Tonglu, 2800–3000 m (Jun. 7, 1960, fr.); Minchin Dhap–Mul Pokhari, 2800–2500 m (Oct. 29, 1963, bud); Taplethok–Helok, 1400–1500 m (Nov. 6, 1963, bud); Helok, 1500 m (Nov. 9, 1963, bud); Thakma Khola, 2500 m (Nov. 12 & 16, 1963, bud); Siling Tzokupa, 2800 m (Nov. 21, 1963).

Distr. Himalaya (Nepal to Bhutan), S. E. Tibet, Manipur, Naga Hills, N. Burma, and W. & C. China.

See a note on page 640.

BEGONIACEAE (by Hiroshi Hara)

Begonia Josephi A. DC. in Ann. Sci. Nat. ser. 4, **11**: 126 (1859); Prodr. **15** (1): 313 (1864), incl. *β. macrocarpa* A. DC.–Fl. Brit. Ind. **2**: 639 (1879).

Bilbatay Bhanjang, 2200 m (Oct. 25, 1963, fr.); Taplejung–Garhi Danra, 1900–2200 m (Nov. 3, 1963, fr.); Helok–Iladanda, 1500–1800 m (Nov. 8, 1963, fr.); Darjeeling, 2150 m (Sep. 10, 1964, fl.); Lagyap, 2200 m (Sep. 13, 1964, fl.).

Distr. E. Himalaya (Nepal, Sikkim).

Begonia megaptera A. DC., l.c. 134 (1859); l.c. 348 (1864)–Fl. Brit. Ind. **2**: 646 (1879).

Illam–Ranga Pani, 1000–400 m (Dec. 8, 1963, fl., fr.).

Distr. E. Himalaya (Nepal, Sikkim).

Begonia nepalensis (A. DC.) Warburg in Engl., Pfl.-fam. III, **6a**: 142 (1894).

Mezierea nepalensis A. DC. in Ann. Sci. Nat. ser. 4, **11**: 144 (1859); Prodr. **15** (1): 406 (1864).

Begonia gigantea Wall. [Cat. no. 3677 (1831), nom. nud.] ex C. B. Clarke in Fl.

Brit. Ind. **2**: 643 (1879).

Ghorwa-Sanichare, 300–200 m (Dec. 10, 1963, fr.);

Distr. E. Himalaya (Nepal, Sikkim).

Begonia palmata D. Don, Prodr. Fl. Nepal. 223 (1825).

B. laciniata Roxburgh, Fl. Ind. ed. 2, **3**: 649 (1832)–Fl. Brit. Ind. **2**: 645 (1879)–Irmscher in Mitt. Inst. Bot. Hamb. **10**: 433 & 525 (1939).

B. laciniata β. nepalensis A. DC., Prodr. **15** (1): 348 (1864).

B. laciniata euta. reg. *nepalensis* (A. DC.) Irmscher, l.c. 526, f. 2 (1939).

Birch Hill, Darjeeling, 2000 m (Jun. 18, 1960, fl.); Simkuna Bazar–Lopchu, 1500–2200 m (Jun. 20, 1960, fl.); Ghatte–Khebang, 1600–2400 m (Nov. 19, 1963).

var **Gamblei** (Irmsch.) Hara, comb. nov.

B. laciniata euta. loc. *Gamblei* Irmscher, l.c. 528, f. 3 (1939).

Mani Bhanjang–Batasi, 2000–2100 m (May 1, 1960, fl.); Batasi, 2000 m (May 2, 1960, fl.); Gangtok, 1600 m (Jun. 15, 1960, fl.); Penlong La, Gangtok, 2100 m (Jun. 16, 1960, fl.); Tista, 300 m (Jun. 19, 1960, fl.); Darjeeling, 2100 m (Jun. 24, 1960, fl., fr.); Birwa–Yektin, 2900–1600 m (Nov. 28, 1963, fr.).

Distr. sp. E. Himalaya (Nepal to Bhutan), Khasia, Manipur, Burma, and W. & S. China.

Begonia picta Smith, Exot. Bot. **2**: t. 101 (1805)–Fl. Brit. Ind. **2**: 638 (1879).

Godavari, Kathmandu, 1500 m (Sep. 18, 1963, fl.); Sunderijal, 1600 m (Sep. 20, 1963, fl., fr.); Chovar, Kathmandu, 1200 m (Sep. 21, 1963, fr.); Sanguri Bhanjang, 1200 m (Oct. 16, 1963, fr.); Zalipur, near Gangtok, 1000 m (Sep. 12, 1964, fl., fr.).

Distr. Himalaya (Kunawar to Bhutan), Khasia, and Manipur.

Begonia rubro-venia Hook. f. in Bot. Mag. t. 4689 (1853)–Fl. Brit. Ind. **2**: 645 (1879).

Tista, 300 m (Jun. 20, 1960, fl., fr.); Pouwa, Kathmandu, 1600 m (Oct. 9, 1963, fl., fr.); Garhi Danra–Tuwa, 2200–1800 m (Nov. 4, 1963, fr.); Tuwa–Taplethok, 1800–1400 m (Nov. 5, 1963, fr.); Taplethok–Helok, 1400–1500 m (Nov. 6, 1963, fr.); Tharpu–Chyangthaphu (Nov. 26, 1963, fr.).

Distr. E. Himalaya (Nepal to NEFA), Khasia, and Manipur.

Begonia scutata Wallich [Cat. no. 3686 (1831), p.p.] ex A. DC., Prodr. **15** (1): 328 (1864)–Fl. Brit. Ind. **2**: 642 (1879).

Sunderijal Waterfall, Kathmandu, 1600 m (Sep. 20, 1963, fl.).

Distr. E. Himalaya (Nepal, Sikkim.).

Begonia sikkimensis A. DC., l.c. 134 (1859); l.c. 349 (1864)–Fl. Brit. Ind. **2**: 646 (1879).

Sanguri Bhanjang, 900–1200 m (Oct. 16, 1963, fl., fr.); Tuwa–Taplethok, 1800–1400 m (Nov. 5, 1963, fr.).

Distr. E. Himalaya (Nepal, Sikkim).

THYMELAEACEAE (by Hiroshi Hara)

Daphne Bholua Hamilton ex D. Don, Prodr. Fl. Nepal. 68 (1825)–Burtt in Kew Bull. **1936**: 437 (1936).

D. cannabina Lour.? ex Wallich in Asiat. Research. **13**: 385, t. 8 (1820), p.p.–Fl. Brit. Ind. **5**: 193 (1886), p.p.–W. W. Smith et Cave in Rec. Bot. Surv. Ind. **6**: 54, t. col., f. 1 (1913).

Darjeeling, 2100 m (Apr. 2, 1960, fr.; Dec. 25, 1963, fl.); Senchal, 2350 m (Dec. 27, 1963, fl.); Batasi–Palmajua, 2300–2600 m (May 3, 1960, no. 82, fr.); Palmajua–Rimbick, 2000 m (May 5, 1960); Tendong Peak–Damthang, 2880–2200 m (Mar. 26, 1963, fl., fr.); near Murhay, 2000 m (Oct. 23, 1963); Bilbatay Bhanjang, 2200 m (Oct. 26, 1963); Minchin Dhap–Mul Pokhari, 2500 m (Oct. 29, 1963, fl.); below Lelep, 2500 m (Nov. 9, 1963); Yektin–Batasay, 1900 m (Nov. 30, 1963, bud); Batasay–Halhale Bhanjang, 2400–2700 m (Dec. 1, 1963, fl.); Bhandukay Bhanjang–Mai Majuwa, 2600 m (Dec. 3, 1963, fl.); Mai Majuwa–Mai Pokhari, 1900–1600 m (Dec. 4, 1963, fl.).

Distr. E. India (Nepal to NEFA), and W. China (Yunnan).

var. **glacialis** (Smith et Cave) Burtt, l.c. 438 (1936).

D. cannabina var. *glacialis* W. W. Smith et Cave, l.c. 52 (1913).

Sandakphu–Phalut, 3500 m (May 8, 1960, fl.); Chia Bhanjang–Phalut, 3100–3500 m (Jun. 2, 1960, no. 769); Sandakphu–Kala Pokhari, 3500–3000 m (Jun. 7, 1960, no. 703); Selap–Walunchung Gola, 2600–3800 m (Nov. 10, 1963, bud); above Tutay, 2800 m (Oct. 26, 1963); Thakma Khola, 3200 m (Nov. 13, 1963).

Distr. E. Himalaya (Nepal, Sikkim).

The variety growing at higher altitudes differs from the type by deciduous leaves, late-flowering habit, and less hairy reddish brown young branches.

Diplomorpha canescens (Meisn.) C. A. Meyer in Bull. Acad. Sci. St.-Pétersb. ser. 2, **1**: 358 (1843); in Ann. Sci. Nat. ser. 2, **20**: 50 (1843).

Wikstroemia canescens Meisner in Denkschr. Regensb. Bot. Ges. **3**: 288 (1841)–Fl. Brit. Ind. **5**: 195 (1886)–Rehder in Pl. Wilson. **2**: 536 (1916).

Kakani, 2200 m (Sep. 24, 1963, fl.).

Distr. Afghanistan, Himalaya (Kumaon to Nepal), Khasia, Ceylon, and China.

Edgeworthia Gardneri (Wallich) Meisner in Denkschr. Regensb. Bot. Ges. **3**: 280 (1841)–Fl. Brit. Ind. **5**: 195 (1886), p.p.–Nakai in Journ. Arn. Arb. **5**: 82 (1924)–Spring Fl. Sikkim Himal. f. 175 (1963). [Pl. 15 b]

Daphne Gardneri Wallich in Asiat. Research. **13**: 388, t. 9 (1820).

Pamianchi–Tingling Bridge, 2000–1000 m (May 15, 1960, no. 254); Gangtok, 1650 m (Apr. 26, 1960); Penlong La, 2100 m (Mar. 18, 1963, fl.); above Tutay, 2700 m (Oct. 26 & 27, 1963, bud); Garhi Danra–Tuwa, 1500–2000 m (Nov. 4, 1963, fl.); Iladanda–Selap, 2500 m (Nov. 9, 1963, bud); Bhandukay–Yamphodin, 2300 m (Nov. 16, 1963, bud); below Siling Tzokupa, 2100 m (Nov. 21, 1963, fl.); Birwa–Yektin, 2900–1600 m (Nov. 28, 1963, bud).

Distr. E. Himalaya (Nepal to Bhutan), Manipur, N. Burma, and W. China (Yunnan).

See a note on page 640. The barks of *Edgeworthia* and *Daphne* are widely used for manufacturing a superior kind of paper in Sikkim and Nepal.

ELAEAGNACEAE (by Yasuiti Momiyama)

Elaeagnus arborea Roxb., Fl. Ind. ed. Carey, **1**: 461 (1820); ed. 2, **1**: 441 (1832)–Schlecht. in DC., Prodr. **14**: 611 (1857); in Linnaea **30**: 359 (1860)–Servettaz in Beih. Bot. Centralbl. Abt. 2, **25**: 70, fig. 4, 4–9 (1909).

Elaeagnus latifolia Hook. f., Fl. Brit. Ind. **5**: 202 (1890), p.p.

Tharpu–Chyangthaphu, 1200–1300 m (Nov. 26, 1963, fl.).

Distr. E. Himalaya (Nepal, Bhutan), Garrow Hills, and W. China.

Elaeagnus conferta Roxb., Fl. Ind. ed. Carey, **1**: 460 (1820); ed. 2, **1**: 440 (1832)-Schlecht. in DC., Prodr. **14**: 612 (1857); in Linnaea **30**: 367 (1860)-Servettaz in Beih. Bot. Centralb. Abt. 2, **25**: 89, fig. 5, 1–6, & 12 (1909).

Elaeagnus latifolia Hook. f., Fl. Brit. Ind. **5**: 202 (1890), p.p.

Ramam–Phalut, 2400–3500 m (May 9, 1960); Chia Bhanjang–Dentam (May 11, 1960); above Tutay, 2500 m (Oct. 26, 1963, fl.); Tutay–Hati Sar, 2500–2900 m (Oct. 27, 1963, fl.); Hati Sar–Minchin Dhap, 2700–2900 m (Oct. 28, 1963, fl.); Selap–Walunchung Gola, 2600–3800m (Nov. 10, 1963, fl.); Yamphodin–Ghatte, 2100–1600 m (Nov. 18, 1963, bud); Batasay–Bhuspate Danra, 2400–2800 m (Dec. 1, 1963, fl.).

Distr. E. Himalaya (Nepal, Sikkim), Assam, and Khasia.

LYTHRACEAE (by Hiroshi Hara)

Ammannia auriculata Willdenow, Hort. Berol. **1**: 7, t. 7 (1806)-Koehne in Pfl.-reich IV-216, Ht. **17**: 45 (1903).

A. senegalensis Lamarck sensu Fl. Brit. Ind. **2**: 570 (1879).

Kathmandu, 1400 m (Oct. 13, 1963, fr.).

Distr. sp. Tropical Africa, Caucasus, C. Asia, Iran, India, east to China, south to Philippines and Australia, and Americas.

Ammannia baccifera L., Sp. Pl. ed. 1, **1**: 120 (1753)-Fl. Brit. Ind. **2**: 569 (1879)-Koehne, l.c. 53 (1903)-Hara, Enum. Sperm. Jap. **3**: 243 (1954).

Dumhan, 700 m (Oct. 31, 1963, fl.); Illam–Ranga Pani, 1200–400 m (Dec. 8, 1963, fr.); Mahara Bahara–Kathgara, 200 m (Dec. 13, 1963, fl.); Kathgara–Rangali, 200 m (Dec. 14, 1963, fl., fr.).

Distr. sp. Tropical Africa, S. Europe, Caucasus, Asia Minor, India, east to China and S. Japan, south to Malaysia, and Australia.

Ammannia multiflora Roxburgh, Fl. Ind. ed. Carey, **1**: 447 (1820)-Fl. Brit. Ind. **2**: 570 (1879)-Koehne, l.c. 48 (1903).

Kathmandu–Thankot, 1300 m (Sep. 20, 1963, fr.).

Distr. Africa, W. Asia, India, east to China and Japan, south to Malaysia and Australia.

Lagerstroemia parviflora Roxburgh, Pl. Corom. **1**: 47, t. 66 (1795)-Fl. Brit. Ind. **2**: 575 (1879), var. *benghalensis* C. B. Clarke-Koehne, l.c. 258 (1903), subsp. *napaulensis* (DC.) Koehne.

Dumhan, 800 m (Oct. 31, 1963); Illam–Ranga Pani, 800–400m, (Dec. 8, 1963); Sibganja–Mahara Bahara, 200 m (Dec. 12, 1963, fr.).

Distr. Tropical Himalaya, India, and Burma.

Lagerstroemia speciosa (L.) Persoon, Syn. Pl. **2**: 72 (1807)-Koehne, l.c. 261, f. 55 P–T & 56 B (1903), p.p.

Muenchhausia speciosa L. ex Murray, Prodr. Stirp. Gotting. t. 2 (1770).

Lagerstroemia Flos Reginae Retzius, Observ. Bot. **5**: 25 (1789)-Fl. Brit. Ind. **2**: 577 (1879), p.p.-Craib, Fl. Siam. Enum. **1**: 723 (1931).

L. Reginae Roxb., Pl. Corom. **1**: 46, t. 65 (1795).

Saramsa Medicinal Garden, 1000 m (Jun. 17, 1960, fl.); Tista, 600 m (Jun. 19, 1960, fl.).

Distr. Tropical Himalaya, India, east to S. China, south to Malaysia, and

Australia.

Rotala densiflora (Roth) Koehne in Engl., Bot. Jahrb. **1**: 164 (1880); l.c. 35, f. 3 C (1903).

Ammannia densiflora Roth ex Roem. et Schult., Syst. Veg. **3**: 304 (1818).

A. pentandra Roxb., Fl. Ind. ed. Carey, **1**: 448 (1820), p.p.–Fl. Brit. Ind. **2**: 568 (1879), p.p.

Kathmandu–Thankot, 1300 m (Sep. 20, 1963, fl.).

Distr. Tropical Africa, Afghanistan, India, east to China, Malaysia, and Australia.

Rotala diversifolia Koehne in Engl., Bot. Jahrb. **41**: 77 (1907)–Fl. Gén. Ind.-Chin. **2**: 974, f. 105, 6–9 (1921).

Khebang–Bharomdin, 1700–1000 m (Nov. 24, 1963, fr.).

Distr. India, Thai, and Indo-China.

Rotala indica (Willd.) Koehne in Engl., Bot. Jahrb. **1**: 172 (1880); l.c. 40 (1903)–Hara, Enum. Sperm. Jap. **3**: 247 (1954).

Peplis indica Willd., Sp. Pl. **2**: 244 (1799).

Ammannia peploides Spreng., Syst. Veg. **1**: 444 (1825)–Fl. Brit. Ind. **2**: 566 (1879).

Kathmandu, 1400 m (Oct. 13, 1963, fl.); Biratnagar, 200 m (Oct. 14, 1963); Dumhan, 700m (Oct. 31 & Nov. 1, 1963); Illam–Ranga Pani, 1200–400m (Dec. 8, 1963, fl.); Ghorwa–Sanichare, 300–200 m (Dec. 10, 1963, fl.); Sibganja–Gauriganja, 200 m (Dec. 12, 1963, fl.); Mahara Bahara–Kathgara, 200 m (Dec. 13, 1963, fl.).

Distr. sp. Iran, Himalaya, India, east to China, Amur and Japan, and Malaysia.

Rotala leptopetala (Bl.) Koehne in Engl., Bot. Jahrb. **4**: 388 (1883); l.c. 34 (1903).

Ammannia leptopetala Blume, Mus. Bot. Lugd.-Bat. **2**: 134 (1852).

A. pentandra Roxb. sensu Fl. Brit. Ind. **2**: 568 (1879), p.p.

Kathgara–Rangali, 200 m (Dec. 14, 1963, fr.).

Distr. sp. Afghanistan, India, east to China and Japan, and south to Malaysia.

Rotala rotundifolia (Roxb.) Koehne in Engl., Bot. Jahrb. **1**: 175 (1880); l.c. 41, f. 4 D (1903)–Hara, l.c. 248 (1954).

Ammannia rotundifolia Hamilt. ex Roxb., Fl. Ind. ed. Carey, **1**: 446 (1820)–Fl. Brit. Ind. **2**: 566 (1879).

Taplejung–Garhi Danra, 1900–2200 m (Nov. 3, 1963, bud); Khebang–Bharomdin, 1700–1000 m (Nov. 24, 1963).

Distr. Himalaya, India, Ceylon, N. Thai, east to S. & C. China, Formosa, and S. Japan.

Woodfordia fruticosa (L.) Kurz in Journ. Asia. Soc. Beng. **40** (2): 56 (1871)–Koehne l.c. 79 (1903).

Lythrum fruticosum L., Sp. Pl. ed. 2, **1**: 641 (1762).

Grislea tomentosa Roxburgh, Pl. Corom. **1**: 29, t. 31 (1795).

Woodfordia floribunda Salisbury, Parad. Lond. t. 42 (1806)–Fl. Brit. Ind. **2**: 572 (1879)–Collet, Fl. Siml. 193, f. 57 (1921).

Sombari–Naya Bazar, 700 m (Mar. 27, 1963, fl.); Bharomdin–Tharpu, 700–1200 m (Nov. 25, 1963); Tharpu–Chyangthaphu, 1200–1300 m (Nov. 26, 1963, fl.); Yektin, 1400 m (Nov. 29, 1963); Ranga Pani–Ghorwa, 700–300m (Dec. 9, 1963, fr.); Ghorwa–Sanichare, 300–200 m (Dec. 10, 1963).

Distr. India, Malaysia, China, and Africa.

The dried flowers are sold at Darjeeling Bazar for a remedy of dysentery.

SONNERATIACEAE (by Hiroshi Hara)

Duabanga grandiflora (Roxb.) Walpers, Rep. **2**: 114 (1843)–Fl. Males. **4**: 289 (1951).

Lagerstroemia grandiflora Roxb. ex DC. in Mém. Soc. Hist. Nat. Genèv. **3** (2): 84 (1826); Prodr. **3**: 93 (1828).

Duabanga sonneratioides Hamilt. in Trans. Linn. Soc. **17**: 177 (1835)–Fl. Brit. Ind. **2**: 579 (1879).

Siliguri–Kurseong, 1200 m (Apr. 29, 1960, fr.); Tista–Rangpo, 400 m (Jun. 13, 1960, fr.); Dumhan, 700 m (Oct. 31 & Nov. 1, 1963, fl.); Bharomdin–Tharpu, 700–1200 m (Nov. 25, 1963, fr.).

Distr. Tropical E. Himalaya (Nepal to Bhutan), Assam, Burma, east to W. China, and south to Malay Peninsula.

ALANGIACEAE (by Hiroshi Hara)

Alangium alpinum (Clarke) W. W. Smith et Cave in Rec. Bot. Surv. India **6**: 96, t. 2 (1914).

Marlea begoniaefolia Roxb. var. *alpina* C. B. Clarke in Fl. Brit. Ind. **2**: 744 (1879).

Marlea alpina Gamble ex Brandis, Ind. Tree. 355 (1906).

Yoksam–Bakkim, 1700–2200 m (May 18, 1960, no. 406, fl.); Dentam–Pamianchi, 1400–2000 m (May 12, 1960, no. 210, fl.); Mani Bhanjang–Batasi, 2000 m (May 1, 1960, fl.); Garibans–Tonglu, 2800–3000 m (Jun. 7, 1960, fl.); above Tutay, 2700 m (Oct. 26, 1963).

Distr. E. Himalaya (E. Nepal to Bhutan).

Alangium chinense (Lour.) Harms in Ber. Deuts. Bot. Ges. **15**: 24, in textu (1897)–Rehder, Bibl. 487 (1949).

Stylidium chinense Loureiro, Fl. Cochinch. **1**: 221 (1790).

Marlea begoniaefolia Roxburgh, Pl. Corom. **3**: 80, t. 283 (1819)–Fl. Brit. Ind. **2**: 743 (1879), p.p.

Alangium begoniaefolium (Roxb.) Baillon, Hist. Pl. **6**: 270 (1877)–Wangerin in Pfl.-reich IV–220 b, Ht. **41**: 20 (1910), p.p.

A. chinense (Loureiro) Rehder in Pl. Wilson. **2**: 552 (1916), p.p.–Bloembergen in Blumea **1**: 255 (1935); in Bull. Jard. Bot. Buitenz. ser. 3, **16**: 169 (1939).

Tingling Bridge–Yoksam, 1000–1700 m (May 16, 1960, no. 313, fl.); Dhankuta, 1200m (Oct. 19, 1963); Sinduwa, 2100m (Oct. 24, 1960); Dumhan–Taplejung, 1400 m (Nov. 1, 1963); Taplejung, 1900 m (Nov. 2, 1963, fr. juv.); Khebang–Siling Tzokupa, 1700–2100 m (Nov. 20, 1963, fr.).

Distr. Tropical Africa, Himalaya, Assam, Burma to China, and Malaysia.

COMBRETACEAE (by Hiroo Kanai)

Anogeissus latifolius (Roxb.) Wall. [Cat. no. 4015 (1832), nom. nud.] ex Bedd., Fl. Sylv. t. 15 (1869)–Fl. Brit. Ind. **2**: 450 (1878).

Conocarpus latifolius Roxb. [Hort. Beng. 34 (1814), nom. nud.] ex DC., Prodr. **3**: 17 (1828).

Tamur Bridge–Dhankuta, 600 & 700 m (Oct. 17, 1963, fr.).

Distr. Nepal, and India.

Combretum chinense Roxb. [Hort. Beng. 28 (1814), nom. nud.] Fl. Ind. ed. 2, **2**: 230 (1832)–Fl. Brit. Ind. **2**: 457 (1878)–Exell in Sunyatsenia **1**: 89 (1933).

Dentam–Pamianchi, 1400–2000 m (May 12, 1960, no. 219, fl.); Yoksam, 1700 m (May 17, 1960, fl.); Helok, 1600 m (Nov. 8, 1963, fr.); Iladanda–Helok, 1700 m (Nov. 8 & 13, 1963, fr.); Ghatte–Khebang, 1700 m (Nov. 19, 1963, fr.).

Distr. Nepal, India, Burma, and Indo-China.

Combretum decandrum Roxb., Pl. Corom. **1**: 43, t. 59 (1795)–Fl. Brit. Ind. **1**: 452 (1878)–Gagnep. in Fl. Gén. Ind.-Chin. **2**: 774 (1920).

Chisa Pani–Loohya Mai, 700 m (Dec. 9, 1963, fl.); Ghorwa–Sanichare, 200 m (Dec. 10, 1963, fl.); Sanichare, 200 m (Dec. 10, 1963, fl.).

Distr. Nepal, India, Burma, Indo-China, and W. China (Yunnan).

Terminalia alata Heyne ex Roth, Nov. Pl. Sp. 379 (1821).

Pentaptera tomentosa Roxb., Fl. Ind. ed. 2, **2**: 440 (1832).

T. tomentosa (Roxb.) Wight et Arn., Prodr. **1**: 314 (1834)–Fl. Brit. Ind. **2**: 447 (1878).

Dumhan–Taplejung, 1000 & 1100 m (Nov. 1, 1963, fr.); Tharpu–Chyangthaphu, 1000 m (Nov. 26, 1963, fr.); Sibganja–Mahara Bahara, 200 m (Dec. 12, 1963, fr.); Gauriganja–Rangali, 200 m (Dec. 13, 1963, fr.).

Distr. Himalaya, Deccan, Ceylon, Burma, Thai, and Indo-China.

Terminalia bellirica (Gaertn.) Roxb., Pl. Corom. **2**: 54, t. 198 (1798)–Fl. Males. **4** (5): 169 (1954).

Myrobalanus bellirica Gaertn., Fruct. et Sem. **2**: 90, t. 97, f. a-d (1791).

T. belerica C. B. Clarke in Fl. Brit. Ind. **2**: 445 (1878).

Illam–Jog Mai, 700 m (Dec. 8, 1963, fr.); Sibganja–Mahara Bahara, 200 m (Dec. 12, 1963, fl. & fr.).

Distr. Nepal, India, Ceylon, Burma, Thai, Indo-China, and Malaysia.

Terminalia Chebula Retz., Obs. Bot. **5**: 31 (1789)–Fl. Brit. Ind. **2**: 446 (1878)–Gagnep. in Fl. Gén. Ind.-Chin. **2**: 752 (1920).

Illam–Jog Mai, 600 m (Dec. 8, 1963, fr.); Sibganja–Mahara Bahara, 200 m (Dec. 12, 1963, fr.).

Distr. Nepal, India, Ceylon, Burma, Thai, Indo-China, and Malaya.

Terminalia myriocarpa Heurck et Muell.-Arg., Obs. Bot. 215 (1870–71)–Fl. Brit. Ind. **2**: 448 (1878)–Fl. Males. **4**: 554 (1954).

Tharpu, 1000 m (Nov. 26, 1963, fr.).

Distr. Himalaya (Nepal, Sikkim, Bhutan), Assam, Burma, Thai, Indo-China, W. China (Yunnan), and N. Sumatra.

MYRTACEAE (by Takasi Tuyama)

Eugenia Kurzii Duthie ex Kurz in Journ. Asia. Soc. Beng. **46** (2): 68 (1877)–Fl. Brit. Ind. **2**: 475b (1878).

Gangtok–Saramsa Medicinal Garden, 1000 m (Jun. 17, 1960).

Distr. E. Himalaya (Sikkim), Assam, Khasia, Mishmi Hills, and Burma.

Psidium Guayava L., Sp. Pl. ed. 1, 470 (1753)–Fl. Brit. Ind. **2**: 468 (1878).

Tista Bazar, 350 m (Jun. 19, 1960); Phusri-Dhara Pani, 450–900 m (Oct. 16, 1963).

Distr. Native of S. America; naturalized elsewhere in India.

Syzygium tetragonum Wallich ex Wight, Ill. Ind. Bot. **2**: 16 (1850).

Eugenia tetragona Wight, l.c. 16 (1850)–Fl. Brit. Ind. **2**: 497 (1878).

Garhi Danra-Tuwa, 2200–1800 m (Nov. 4, 1963).

Distr. E. Himalaya (E. Nepal to Bhutan), and W. China (Yunnan).

MELASTOMATACEAE (by Hiroshi Hara)

Medinilla erythrophylla Lindley, Bot. Reg. **24**: Misc. 85 (1838)–Merrill in Brittonia **4**: 127 (1941)–Li in Journ. Arn. Arb. **25**: 39 (1944).

M. rubicunda Blume sensu Fl. Brit. Ind. **2**: 547 (1879).

Zalipur near Gangtok, 1000 m, on a tree (Sep. 12, 1964, fl.).

Distr. E. Himalaya (Sikkim), N. Burma, and W. China (Yunnan).

Melastoma malabathricum L., Sp. Pl. ed. 1, **1**: 390 (1753), ut *malabathrica*–Fl. Brit. Ind. **2**: 523 (1879)–Bakh. v. Brink in Meded. Bot. Mus. Utrecht **91**: 79 (1943).

Donk Bridge-Bagdogra, 200 m (Apr. 28, 1960, fl.); Sanichare-Sibganja, 200 m (Dec. 11, 1963, fl.).

Distr. India, Ceylon, Burma, Thai, Indo-China, and Malaysia.

Melastoma normale D. Don, Prodr. Fl. Nepal. 220 (1825), ut *M. normalis*–Fl. Brit. Ind. **2**: 524 (1879)–Bakh. v. Brink, l.c. 90 (1943)–Li in Journ. Arn. Arb. **25**: 8 (1944).

Pamianchi-Tingling Bridge, 2000–1000 m (May 15, 1960, no. 265, fl.); Takdah-Rayang (Apr. 20, 1960, no. 2193, fl.); Gangtok, 1500 m (Jun. 16, 1960, fl.); Saramsa, 1200 m (Mar. 21, 1963); Illam-Ranga Pani, 1200–400 m (Dec. 8, 1963, fl.).

Distr. E. Himalaya (Nepal to Bhutan), Khasia, Thai, Indo-China, W. & S. China, Malaysia, south to New Hebrides, and New Caledonia.

Osbeckia nepalensis Hooker, Exot. Fl. **1**: t. 31 (1822)–Fl. Brit. Ind. **2**: 521 (1879)–Li, l.c. 5 (1944).

O. speciosa D. Don, Prodr. Fl. Nepal. 222 (1825), nom. superfl.

Happy Valley, Darjeeling, 1900 m (Apr. 10, 1960, fr.); Kurseong, 1500 m (Apr. 12, 1960, fr.); Godavari, Kathmandu, 1500 m (Sep. 18, 1963, fl.); Sunderijal Waterfall, 1600 m (Sep. 20, 1963, fl.); Dhankuta, 1200 m (Oct. 18 & 19, 1963, fl.); Mul Pokhari-Dumhan (Oct. 30, 1963, fr.); Dumhan-Taplejung, 1200 m (Nov. 1, 1963, fl.); Taplejung-Garhi Danra, 1900–2200 m (Nov. 3, 1963, fl.); Bhandukay-Yamphodin, 2500–2200 m (Nov. 16, 1963, fl.); Ghatte-Khebang, 1600–2400 m (Nov. 19, 1963, fl., fr.); Birwa-Yektin (Nov. 28, 1963, fl.); Dhara Pani-Illam, 1500–1200 m (Dec. 5, 1963, fl.); Sibganja-Gauriganja, 200 m (Dec. 12, 1963, fl.).

Distr. Himalaya (Nepal, Sikkim), Khasia, Burma, Thai, Indo-China, and W. China (Yunnan, Kwangsi).

The flowers are rosy pink or white.

Osbeckia nutans Wallich [ex Triana in Trans. Linn. Soc. **28**: 54 (1871), nom. nud.] ex C. B. Clarke in Fl. Brit. Ind. **2**: 521 (1879).

Sanguri Bhanjang-Dhara Pani, 1200 m (Oct. 16, 1963, fl.).

Distr. E. Himalaya (E. Nepal to NEFA), and Khasia.

Osbeckia sikkimensis Craib in Not. Bot. Gard. Edinb. **10**: 56 (1917).

Mani Bhanjang, 2000 m (May 1, 1960, fr.); Sinduwa, 2100 m (Oct. 24, 1963, fr.); Mul Pokhari–Dumham, 1900 m (Oct. 30, 1963, fl.); Helok–Baroya Khimty, 1500–2500 m (Nov. 10, 1963, fr.); Darjeeling, 2100 m (Apr. 7, 1960, fr.; Jun. 24, 1960, fr.; Sep. 10, 1964, fl.); Gangtok, 1650 m (Sep. 13, 1964, fl.).

Distr. E. Himalaya (E. Nepal, Sikkim), Manipur, and N. Burma?

Osbeckia stellata D. Don in Bot. Reg. **8**: t. 674 (1822)–Hooker, Exot. Fl. **1**: t. 37 (1823)–Fl. Brit. Ind. **2**: 517 (1879).

Godavari, Kathmandu, 1500 m (Sep. 18, 1963, fl.); Sanguri Bhanjang, 800–1200 m (Oct. 16, 1963, fr.); Helok–Lelep, 2200 m (Nov. 9, 1963, fr.); Ghatte–Khebang, 1600–2400 m (Nov. 19, 1963, fr.).

Distr. Himalaya (Punjab to NEFA), Assam, N. Burma?, Thai, and W. & C. China?

Oxyspora paniculata (D. Don) DC., Prodr. **3**: 123 (1828)–Wall., Pl. Asia. Rar. **1**: t. 88 (1830)–Fl. Brit. Ind. **2**: 525 (1879)–Li in Journ. Arn. Arb. **25**: 12 (1944).

Arthrostemma paniculatum D. Don in Mem. Wern. Soc. **4**: 299 (1822).

Oxyspora vagans Wall. sensu Hook. in Bot. Mag. t. 4553 (1850).

Darjeeling, 2000 m (Apr. 7, 1960, fr.); Takdah, 1700 m (Apr. 19, 1960, no. 2126, fr.); Gangtok, 1650 m (Apr. 26, 1960, fr.); Pamianchi–Tingling Bridge, 2000–1000 m (May 15, 1960, no. 253, fr.); Sunderijal, Kathmandu, 1600 m (Sep. 20, 1963, fl.); Murhay, 2100 m (Oct. 22, 1963, fl., fr.); Dhankuta–Hilay, 1200–1700 m (Oct. 23, 1963, fl.); Mul Pokhari–Dumhan (Oct. 30, 1963, fl.); Yamphodin–Ghatte, 2000–1600 m (Nov. 16, 1963, fl.); Mai Majuwa–Dhara Pani, 1500-1900 m (Dec. 4, 1963, fr.).

Distr. E. Himalaya (Nepal to NEFA), Khasia, Manipur, Indo-China, and China (Yunnan, Kweichow, Kwangsi).

Sarcopyramis napalensis Wallich, Tent. Fl. Napal. 32, t. 23 (1826)–Fl. Brit. Ind. **2**: 541 (1879)–Bakh. v. Brink, l.c. 246 (1943)–Li, l.c. 25 (1944).

S. lanceolata Wall. [Cat. no. 6290 (1832), nom. nud.] ex Bennett, Pl. Jav. Rar. 214 (1844)–Bakh. v. Brink, l.c. 245 (1943).

Takdah, 1600 m (Apr. 19, 1960, fr.); Sinduwa, 2100 m (Oct. 23, 1963, fr.); Murhay 2000 m (Oct. 24, 1963, fr.); Bilbatay Bhanjang, 2200 m (Oct. 25 & 26, 1963, fr.); Hati Sar–Minchin Dhap, 2700–2900 m (Oct. 28, 1963, fr.); Minchin Dhap–Pul Pokhari (Oct. 29, 1963, fr.); Taplejung–Garhi Danra, 1900–2200 m (Nov. 3, 1963, fr.); Baroya Khimty, 2500 m (Nov. 11, 1963, fr.); Thakma Khola, 3200 m (Nov. 12, 1963, fr.); Ghatte–Khebang, 1600–2400 m (Nov. 19, 1963, fr.); Chyangthaphu–Birwa (Nov. 27, 1963, fr.); Yektin–Batasay, 1400–2400 m (Nov. 30, 1963, fr.); Mai Majuwa-Mai Pokhari, 1600 m (Dec. 4, 1963, fr.); Darjeeling, 2150 m (Sep. 10, 1964, fl.); Gatribas, 2800 m (Sep. 16, 1964, fr.); Senchal, 2400 m (Sep. 19, 1964, fl.).

Distr. Himalaya (Nepal to Bhutan), Khasia, Manipur, Burma, Malay, Sumatra, and C. & S. China.

Bakhuizen van den Brink (1943) distinguished *Sarcopyramis lanceolata* Wall. ex Bennett from *S. napalensis* Wall. Our collections cited above are very variable. Some have broader ovate leaves with long hairs on the upper side, and some others have lanceolate-ovate leaves which are glabrescent above. These characters, however, are not correlated with one another, and specimens showing intermediate characters are often observed. So, *S. napalensis* is here treated in a wide sense, including *S. lanceolata*.

Sonerila Kurzii C. B. Clarke in Fl. Brit. Ind. **2**: 539 (1879).

Zalipur near Gangtok, 1000 m, on wet rocks (Sep. 12, 1964, fl. rose).

Distr. Sikkim.

Sonerila tenera Royle, Ill. Bot Himal. 215, t. 45, f. 2 (1834)–Fl. Brit. Ind. **2**: 530 (1879)–Li in Journ. Arn. Arb. **25**: 36 (1944).

Dhara Pani–Tamur Bridge, 700 m (Oct. 17, 1963, fr.).

Distr. Himalaya (Chota Nagpore to Sikkim), Khasia, Indo-China, S. China, and Philippines.

ONAGRACEAE (by Hiroshi Hara)

Circaea alpina L., Sp. Pl. ed. 1, **1**: 9 (1753).

subsp. **imaicola** (Asch. et Magn.) Kitamura, Fl. Afghan. 279 (1960).

C. alpina var. *imaicola* Ascherson et Magnus in Bot. Zeit. **28**: 750 & 787 (1870), p.p.

C. Pricei Hayata, Icon. Pl. Formos. **5**: 72 (1915)–Hara in Journ. Jap. Bot. **10**: 588 (1934).

C. imaicola (Asch. et Magn.) Hand.-Mzt., Symb. Sin. **7**: 603 (1933).

Above Tutay, 2600 m (Oct. 26, 1963, fr.); Hati Sar–Minchin Dhap, 2700–2900 m (Oct. 28, 1963, fl., fr.); Taplejung–Bunklung, 2000 m (Nov. 3, 1963, fr.).

Distr. Afghanistan, Himalaya, Khasia, China, and Formosa.

The subspecies differs from *C. alpina* L. in having minutely pubescent stems, glandular-pubescent inflorescences, and leaves (less cordate) rotundate or broadly cuneate at the base. It seems to be connected with *C. alpina* through var. *pilosula* (Hara) Hara of China and Japan.

Circaea repens Wallich ex Ascherson et Magnus in Bot. Zeit. **28**: 761 (1870)–Hand.-Mzt., Symb. Sin. **7**: 604 (1933).

C. lutetiana L. sensu Fl. Brit. Ind. **2**: 589 (1879).

C. alpina L. var. *himalaica* C. B. Clarke in Fl. Brit. Ind. **2**: 589 (1879).

Murhay, 2100 m (Oct. 23, 1963, fr.); Sinduwa–Chitray, 2100 m (Oct. 24, 1963, fr.); Gatribas, 2800 m (Sep. 16, 1964, fl. & fr.).

Distr. Himalaya (Kumaon to NEFA), and W. China (Yunnan).

Although the species resembles *C. lutetiana* L. in general appearance and in pubescence, it cleary differs from the latter by unilocular ovary, smaller flowers, shorter hypanthium, unlobed stigma, inconspicuous disk, and narrower one-seeded fruits. It is closely allied to *C. alpina* ssp. *imaicola*, but it is larger in all respects, and has more densely pubescent ovaries, and fruits with uncinate longer rigid bristles 0.6–0.9 mm long.

Epilobium brevifolium D. Don, Prodr. Fl. Nepal. 222 (1825)–Hausskn., Monogr. Epilob. 207 (1884)–Raven in Bull. Brit. Mus. Bot. **2**: 361 (1962).

E. trichoneurum Hausskn. in Oester. Bot. Zeits. **29**: 54 (1879).

E. Hookeri C. B. Clarke in Fl. Brit. Ind. **2**: 585 (1879).

Bilbatay Bhanjang–Hati Sar, 2400–2900 m (Oct. 27, 1963, fr.); Hati Sar–Minchin

Dhap, 2700–2900 m (Oct. 28, 1963, fr.); Sinduwa, 2100 m (Oct. 23 & 24, 1963, fr.).

Distr. sp. Himalaya (Punjab to NEFA), S. E. Tibet, Khasia, Manipur, Naga Hills, Burma, N. Philippines, and W. & S. China.

Our specimens belong mostly to subsp. *trichoneurum* (Hausskn.) Raven. The specimens collected on mossy rocks are dwarf with very small leaves less than 1 cm long.

Epilobium cylindricum D. Don, Prodr. Fl. Nepal. 222 (1825)–Hausskn., Monogr. Epilob. 200 (1884)–Raven, l.c. 355 (1962).

E. roseum var. *cylindricum* (D. Don) C. B. Clarke, l.c. 585 (1879).

Kathmandu–Kakani, 1600–2000 m (Sep. 24, 1963, fl., fr.); above Helok, 1600 m (Nov. 8, 1963, fl., fr.); Baroya Khimty–Thakma Khola, 2500–3200 m (Nov. 16, 1963, fr.).

Distr. N. E. Afghanistan, Himalaya (Kashmir to Bhutan), S. E. Tibet, and W. & C. China.

Epilobium sikkimense Haussknecht, l.c. 52 (1879); l.c. 204 (1884).

subsp. **Ludlowianum** Raven, l.c. 373, t. 36 A (1962).

Sandakphu, 3600 m (Sep. 16, 1964, fr.).

Distr. Himalaya (Garhwal to Bhutan), S. Tibet, N. Burma, and W. China.

Epilobium Wallichianum Haussknecht, l.c. 54 (1879); l.c. 218, t. 8, f. 52 (1884)–Raven, l.c. 365 (1962).

E. tetragonum L. sensu Fl. Brit. Ind. **2**: 586 (1879).

Sinduwa–Chitray, 2100 m (Oct. 24, 1963, fl., fr.); Minchin Dhap–Mul Pokhari, 2900–2500 m (Oct. 29, 1963); Thakma Khola, 3000–3300 m (Nov. 12 & 16, 1963); Bhuspate Danra, 2600 m (Dec. 2, 1963); Gatribas–Tonglu, 2900 m (Sep. 17, 1964); Lagyap, 2200 m (Sep. 13, 1964, fl., fr.).

Distr. E. Himalaya (Nepal to Bhutan), S. Tibet, Khasia, Naga Hills, and W. China (Yunnan).

Ludwigia adscendens (L.) Hara in Journ. Jap. Bot. **28**: 291 (1953); Enum. Sperm. Jap. **3**: 271 (1954)–Raven in Reinwardtia **6**: 387 (1963).

Jussiaea repens L., Sp. Pl. ed. 1, **1**: 388 (1753)–Fl. Brit. Ind. **2**: 587 (1879).

J. adscendens L., Mant. Pl. **1**: 69 (1767).

Sibganja–Gauriganja, 200 m (Dec. 12, 1963); Sibganja–Mahara Bahara, 200 m (Dec. 12, 1963).

Distr. India, east to S. China, Malaysia, and N. Australia.

Ludwigia hyssopifolia (G. Don) Exell in Garcia de Orta **5**: 471 & 474, t. 2 (1957)–Raven, l.c. 385 (1963).

Jussiaea linifolia Vahl, Eclog. Amer. **2**: 32 (1798).

J. hyssopifolia G. Don, Gen. Hist. **2**: 693 (1832).

J. micrantha Kunze in Linnaea **24**: 177 (1851).

Ludwigia micrantha (Kunze) Hara in Journ. Jap. Bot. **28**: 293 (1953); Enum. Sperm. Jap. **3**: 272 (1954).

Biratnagar, 200 m (Oct. 14, 1963, fl., fr.); Ghorwa, 300 m (Dec. 9, 1963, fl., fr.).

Distr. Africa, India, east to Formosa. Malaysia, N. Australia, Polynesia, and Tropical America.

Ludwigia octovalvis (Jacq.) Raven in Kew Bull. **15**: 476 (1962); in Reinwardtia **6**: 356 (1963), subsp. *octovalvis*.

Jussiaea suffruticosa L., Sp. Pl. ed. 1, **1**: 388 (1753)–Fl. Brit. Ind. **2**: 587 (1879).

Oenothera octovalvis Jacquin, Enum. Syst. Pl. 19 (1760).

Jussiaea pubescens L., Sp. Pl. ed. 2, **1**: 555 (1762).

Ludwigia pubescens (L.) Hara, l.c. 293 (1953); l.c. 273 (1954).

Biratnagar, 200 m (Oct. 14, 1963, fl. & fr.); above Dumhan, 900 m (Oct. 30, 1963); Illam–Ranga Pani (Dec. 8, 1963, fr.); Ghorwa–Sanichare, 300–200 m (Dec. 10, 1963); Sibganja–Gauriganja, 200 m (Dec. 12, 1963, fr.).

Distr. sp. Africa, India, east to Japan, Malaysia, Australia, Polynesia, and tropical America.

A part of our collections from above Dumhan has spreading hairs, and is referrable to subsp. *sessiliflora* (Mich.) Raven.

Ludwigia perennis L., Sp. Pl. ed. 1, **1**: 119 (1753)–Raven, l.c. 367 (1963).

L. parviflora Roxburgh, Fl. Ind. ed. Carey, **1**: 440 (1820)–Fl. Brit. Ind. **2**: 588 (1879).

Kathmandu, 1400 m (Oct. 13, 1963, fr.); Biratnagar, 200 m (Oct. 14, 1963, fr.); Nissim–Dumhan, 700–1300 m (Oct. 30 & 31, 1963, fr.); Kathgara–Rangali, 200 m (Dec. 14, 1963).

Distr. Africa, Afghanistan, India, east to S. Japan, Malaysia, Australia, and New Caledonia.

Ludwigia prostrata Roxburgh, Fl. Ind. ed. Carey, **1**: 441 (1820)–Fl. Brit. Ind. **2**: 588 (1879)–Raven, l.c. 374, f. 7 (1963).

Dumhan, Taplejung Distr., 700 m (Oct. 31, 1963, fr.).

Distr. India, Burma, Thai, Indo-China, S. China, and Malaysia.

Ludwigia epilobioides Maximowicz of Japan, Korea, China, and Amur has long been confused with *L. prostrata*, but the distinction between the two species was clearly pointed out by Raven in 1963.

Oenothera erythrosepala Borbás in Magyar Bot. Lapok. **2**: 245 (1903)–Munz in El Aliso **2** (1): 38, t. 6 (1949); det. Y. Asai.

Khebang, 1700 m (Nov. 23, 1963, fl.); Taplejung–Garhi Danra, 1900–2200 m (Nov. 6, 1963, fl. & fr.).

Distr. Originated in Europe; widely naturalized in temperate Asia and N. America.

Oenothera rosea Aiton, Hort. Kew. ed. 1, **2**: 3 (1789).

Kathmandu, 1400 m (Oct. 13, 1963, fl.).

Distr. Native of Peru; naturalized.

ARALIACEAE (by Masami Mizushima, *Panax* by Hiroshi Hara)

Aralia cachemirica Decaisne in Jacquem., Voy. Ind. 72, t. 81 (1844)–Fl. Brit. Ind. **2**: 722 (1879).

Panax decompositum Wallich ex DC., Prodr. **4**: 255 (1830); non *Aralia decomposita* Reinw. ex de Vries (1856–57).

P. tripinnatum Wall. ex G. Don, Gen. Hist. **3**: 384 (1834); non *Aralia tripinnata* Blanco (1837).

A. macrophylla Lindley in Bot. Reg. **1844**: Misc. 73 (1844).

Baroya Khimty–Thakma Khola, 2500–3200 m (Nov. 16, 1963, fr.).

Distr. Afghanistan, and temperate Himalaya (Kashmir to Sikkim).

Brassaiopsis alpina C. B. Clarke in Fl. Brit. Ind. **2**: 736 (1879).

Garibans–Tonglu, 2800 m (Jun. 7, 1960, bud); Sandakphu–Garibans, 3500–2800 m (Jun. 7, 1960, no. 697, bud).

Distr. E. Himalaya (E. Nepal, Sikkim).

The leaves attain much larger than those described by C. B. Clarke and Brandis. The biggest one in our specimens nearly doubles " 4–5 in. and nearly as wide ", but the bigger leaves may be of the young branches or trees.

Brassaiopsis glomerulata (Bl.) Regel in Gartenfl. **12**: 275, t. 411 (1863)–Li in Sargentia **2**: 58 (1942)–J. K. Maheshwari in Bull. Bot. Surv. Ind. **2**: 375 (1960).

Aralia glomerulata Blume, Bijdr. 872 (1826).

B. speciosa Decne. et Planch. in Rev. Hort. ser. 4, **3**: 106 (1854)–Fl. Brit. Ind. **2**: 737 (1879).

Ghorwa–Sanichare, 300–200 m (Dec. 10, 1963, young fl. & fr.).

Distr. Himalaya (Nepal to Assam), Burma, Indo-China, W. & S. China (Yunnan, Kwangsi, Kweichow & Hainan), Sumatra, and Java.

Although C. B. Clarke described the pedicels as 3/4 in. long, those of our specimen are less than half the length (6–9 mm). Li segregated varieties based chiefly on the shape of inflorescence and the length of pedicels. Among the key characters used by him, the texture of leaves seems to be an ecological modification, and the inflorescence, paniculate or corymbose-paniculate, may possibly be the same. The length of pedicels can hardly be tenable.

Brassaiopsis Hainla (Hamilt.) Seemann in Journ. Bot. **2**: 291 (1864)–Fl. Brit. Ind. **2**: 735 (1879)–Li in Sargentia **2**: 52 (1942).

Hedera Hainla Hamilt. ex D. Don, Prodr. Fl. Nepal. 187 (1825).

Ratong Chu–Yoksam, 1100–1700 m (May 16, 1960, fr.); Pamianchi–Tingling Bridge, 2000–1000 m (May 15, 1960, no. 275, fr.); Rabong La–Temi, 1200 m (Mar. 28, 1963, fl.); Dumhan–Taplejung (Nov. 1, 1963, bud); Yektin (Nov. 28, 1963, bud).

Distr. E. Himalaya (Nepal to Bhutan), Assam, and W. China (Yunnan).

Brassaiopsis mitis C. B. Clarke in Fl. Brit. Ind. **2**: 736 (1879).

Rimbick–Ramam, 1900–2400 m (May 7, 1960); Darjeeling, 2100 m (Jun. 23, 24 & 26, 1960, fl.); Sinduwa, 2100 m (Oct. 24, 1963); Zongi–Iladanda (Nov. 12, 1963); Iladanda–Helok, 1800-1500 m (Nov. 13, 1963); Bhandukay, 2500 m (Nov. 16, 1963).

Distr. E. Himalaya (E. Nepal, Sikkim).

Hedera nepalensis K. Koch, Hort. Dendr. 284 (1853)–Rehder, Man. ed. 2, 673 (1940); Bibl. 490 (1949).

H. Helix L. sensu C. B. Clarke in Fl. Brit. Ind. **2**: 739 (1879).

H. himalaica Tobler, Gatt. Hedera 67, Abb. 31–38 (1912).

Rimbick–Ramam, 1900–2400 m (May 7, 1960, no. 141, fr.); above Bilbatay Bhanjang, 2600 m (Oct. 26, 1963, bud); Bilbatay Bhanjang–Hati Sar, 2500 m (Oct. 27, 1963, fl.); above Lelep, 2600 m (Nov. 9, 1963); Iladanda–Selap, 2200 m (Nov. 9, 1963, fl.); Helok–Baroya Khimty, 1900 m (Nov. 10 & 15, 1963, fl.); Zongi–Iladanda, 2600–1800 m (Nov. 12, 1963); Yamphodin–Ghatte, 2000 m (Nov. 16, 1963, fl.).

Distr. Afghanistan, Himalaya (Kashmir to Bhutan), Assam, Burma, and China (var.).

Heteropanax fragrans (D. Don) Seemann, Fl. Viti. 114 (1865)-Fl. Brit. Ind. **2**: 734 (1879)-Li in Sargentia **2**: 93 (1942).

Hedera fragrans D. Don, Prodr. Fl. Nepal. 187 (1825).

Chisa Pani-Ghorwa, 500 m (Dec. 9, 1963, bud & fr.).

Distr. Himalaya (Kumaon to Assam), Burma, the Andamans, Indo-China, and W. & S. China (Yunnan, Kwangtung, Hainan).

Macropanax dispermus (Bl.) O. Kuntze, Rev. Gen. Pl. 271 (1891).

Aralia disperma Bl., Bijdr. 872 (1826).

Hedera disperma (Bl.) DC., Prodr. **4**: 265 (1830).

Panax serratum Wall. ex DC., l.c. 253 (1830).

Macropanax oreophilus Miquel, Fl. Ind. Bat. **1** (1): 764 (1855)-Seem. in Journ. Bot. **2**: 293 (1864)-Fl. Brit. Ind. **2**: 738 (1879)-Li in Sargentia **2**: 61 (1942).

Iladanda-Selap, 2200 m (Nov. 9, 1963, fr.); Helok-Baroya Khimty, 1700-2000 m (Nov. 10, 1963, fr.).

Distr. Himalaya (Kumaon to Bhutan), Assam, Burma, Indo-China, W. & S. China (Yunnan, Hainan), and Malaysia.

Panax pseudo-Ginseng Wallich in Trans. Med. Phys. Soc. Calcutta **4**: 117 (1829); Pl. Asia. Rar. **2**: 30, t. 137 (1831)-Meyer in Bull. Phys.-Math. Acad. St.-Pét. **1**: 340 (1843)-Seemann in Journ. Bot. **6**: 54 (1868)-Li in Sargentia **2**: 117 (1942)-Pei et Chou, Icon. Chin. Med. Pl. **6**: f. 281 (1958)-Jzushritzky, Zhenshen 50 (1961).

P. Schin-seng var. (3) *nepalensis* Nees, Icon. Pl. Med. **5**: t. 16 C (1833).

Aralia pseudo-Ginseng (Wall.) Benth. ex Clarke in Fl. Brit. Ind. **2**: 721 (1879).

A. quinquefolia var. *pseudo-ginseng* (Wall.) Burkill in Kew Bull. **1902**: 7 (1902).

Takdah, 1600-1700 m (Apr. 18 & 19, 1960, no. 2111 & 2151, bud); Lopchu, 1500 m (Apr. 28, 1960, no. 2342).

var. **angustifolius** (Burkill) Li, l.c. 118 (1942).

A. quinquefolia var. *angustifolia* Burkill, l.c. 7 (1902).

Batasi, 2000 m (May 2, 1960, bud); Jongri-Preig Chu, 3600 m (May 23, 1960, bud); Nayathang-Chia Bhanjang, 3300-3100 m (Jun. 2, 1960, bud); Phalut, 3500 m (Jun. 5, 1960, bud); Ghum-Lopchu, 2300-2000 m (Jun. 19, 1960, fl.); Bilbatay Bhanjang, 2200 m (Oct. 25, 1963, fr.); Tonglu, 3000 m (Sep. 16, 1964, fr.).

var. **bipinnatifidus** (Seem.) Li, l.c. 118 (1942).

Panax bipinnatifidum Seemann, l.c. 54 (1868)-Pei et Chou, l.c. f. 278 (1958)-Jzushritzky, l.c. 50 (1961).

Aralia bipinnatifida (Seem.) Clarke, l.c. 722 (1879).

Preig Chu, below Bakkim, 2300 m (May 18, 1960, bud); Phalut-Sandakphu, 3500 m (Jun. 6, 1960, no. 682, bud).

Distr. sp. E. Himalaya (Nepal to NEFA), Khasia, S. Tibet, N. Burma, Thai, Indo-China, and W. & C. China.

See a note on page 641.

Pentapanax Leschenaultii (Wight et Arn.) Seemann in Journ. Bot. **2**: 296, cum fig. (1864)-Fl. Brit. Ind. **2**: 724 (1879)-Li in Sargentia **2**: 98 (1942).

Mani Bhanjang-Batasi, 2000 m (May 1, 1960, bud); Chia Bhanjang-Dentam (May 11, 1960, bud); Preig Chu-Jongri (May 19, 1960, no. 394, bud); Sandakphu-Garibans 3500-2800 m (Jun. 7, 1960, young fl.); Gangtok, 1650 m (Jun. 13, 1960, fr.); Senchal-

Tiger Hill, 2400–2500 m (Jun. 23, 1960, fl.).

Distr. Himalaya (Kumaon to Bhutan), Assam, W. Madras, Burma, and W. China (Yunnan, Szechuan).

Our specimens from Darjeeling have smaller flowers. The calyces are 2.5 mm long about 10-costate (when dried), and the calyx-teeth are often obsolete. The petals are cohering into an early deciduous calyptra. The completely united styles are shorter than the stamens. These features may be of a male flower.

Pentapanax racemosus Seemann in Journ. Bot. **2**: 295 (1864)–Fl. Brit. Ind. **2**: 724 (1879)–Li, l.c. 97 (1942).

Bilbatay Bhanjang–Tinjuray, 2700 m (Oct. 27, 1963).

Distr. E. Himalaya (Nepal, Sikkim), Assam, and W. China (Yunnan).

Schefflera impressa (C. B. Clarke) Harms in Engl., Pfl.-fam. III, **8**: 38 (1894)–Li in Sargentia **2**: 22 (1942).

Minchin Dhap–Mul Pokhari, 2900–2500 m (Oct. 29, 1963); Baroya Khimty, 2500 m (Nov. 11, 1963); Baroya Khimty–Thakma Khola, 2500–3300 m (Nov. 16, 1963); Bhuspate Danra–below Mai Majuwa, 2900–1600 m (Dec. 3, 1963).

Distr. Himalaya (Garhwal to Bhutan), E. Pakistan, and W. China (Yunnan).

Schefflera venulosa (Wight et Arn.) Harms in Engl., Pfl.-fam. III, **8**: 39 (1894)–Li, l.c. 34 (1942)–J. K. Maheshwari in Bull. Bot. Surv. Ind. **2**: 376 (1960).

Heptapleurum venulosum (W. et A.) Seem. in Journ. Bot. **3**: 80 (1865)–Fl. Brit. Ind. **2**: 729 (1879), excl. syn. Bl., Miq., et Seem.

S. elliptica Harms sensu Hand.-Mzt., Symb. Sin. **7**: 691 (1933).

Taplethok–Helok, 1500 m (Nov. 6, 1963, fl.); above Helok, 1700 m (Nov. 8, 1963, fl.); Khebang–Bharomdin, 1200 m (Nov. 24, 1963, young fl.).

Distr. Tropical and subtropical India, Indo-China, W. & S. China, and Malaya.

Heptapleurum venulosum var. *macrophyllum* (Wall.) C. B. Clarke, having leaflets 6–8 in. long, is hardly acceptable. The longest leaflet just below the inflorescence or the next varies from 10 to 20 cm long in our specimens.

Trevesia palmata (Roxb.) Visiani in Mem. Accad. Torino ser. 2, **4**: 262 (1842)–Fl. Brit. Ind. **2**: 732 (1879)–Li in Sargentia **2**: 13 (1942).

Gastonia palmata Roxb., Fl. Ind. ed. Carey, **2**: 407 (1824).

Singtam–Gangtok, 700 m (Mar. 29, 1963, fl.).

Distr. E. Himalaya (Nepal, Sikkim), Assam, Burma, W. China (Yunnan, Kweichow), and Malaya.

UMBELLIFERAE (by Hiroo Kanai, *Hydrocotyle* by Hiroshi Hara)

Bupleurum Candollei Wall. [Cat. no. 552 (1828), nom. nud.] ex DC., Prodr. **4**: 131 (1830)–Fl. Brit. Ind. **2**: 674 (1879)–Wolff in Pfl.-reich IV-228, Ht. **43**: 149 (1910)–Hiroe, Umbel. Asia **1**: 79 (1958).

Phalut–Sandakphu, 3500 m (Jun. 6, 1960); Sandakphu–Kala Pokhari, 3000 m (Sep. 17, 1964, fr.).

Distr. Nepal, and India.

Bupleurum longicaule Wall. [Cat. no. 557 (1828), nom. nud.] ex DC., Prodr. **4**: 131 (1830).

var. **strictum** C. B. Clarke in Fl. Brit. Ind. **2**: 677 (1879)-Wolff, l.c. 123 (1910).

Jongri-Olothang, 3800 m (May 23, 1960, fl.); Migothang, 3900 m (May 31, 1960, no. 591, fl.); Migothang-Nayathang, 3900-3500 m (Jun. 1, 1960, no. 718, fl.).

Distr. var. E. Himalaya, E. Tibet, and China (Szechuan, Hupeh). sp. Altai, Himalaya, Tibet, N. China, and W. Siberia.

Bupleurum tenue Hamilton ex D. Don, Prodr. Fl. Nepal. 182 (1825)-Fl. Brit. Ind. **2**: 677 (1879)-Wolff, l.c. 145 (1910)-Hiroe, Umbel. Asia **1**: 89 (1958).

Sunderijal Waterfall, Kathmandu, 1600 m (Sep. 20, 1963, fl.); Kakani, Kathmandu, 2100-2200 m (Sep. 24, 1963, fl.); Pouwa, Kathmandu, 1600 m (Oct. 9, 1963, fl. & fr.).

Distr. Himalaya, Thai, Indo-China, and China.

Centella asiatica (L.) Urban in Martius, Fl. Brasil. **11**: 287, t. 78, f. 1 (1879)-Hara, Enum. Sperm. Jap. **3**: 303 (1954)-Hiroe, Umbel. Jap. 14 (1958).

Hydrocotyle asiatica L., Sp. Pl. ed. 1, **1**: 234 (1753)-Fl. Brit. Ind. **2**: 669 (1879).

Kalimpong, 1300 m (Apr. 23, 1960, fr.); Gangtok, 1600 m (Jun. 16, 1960, fr.); Godavari, Kathmandu, 1500 m (Sep. 18, 1963, fl.); Murhay, 2100 m (Oct. 23, 1963, fl. & fr.); Khebang, 1400 m (Nov. 23, 1963, fl.).

Distr. Africa, Caucasus, S.E. Asia, Formosa, Japan, Malaysia, Australia, and Oceania.

Chaerophyllum reflexum Lindl. in Royle, Ill. Bot. Himal. 232 (1835)-Fl. Brit. Ind. **2**: 691 (1879)-Hiroe, Umbel. Asia **1**: 46 (1958).

Darjeeling, 2000 m (Jun. 24, 1960, fl.).

Distr. Himalaya.

Coriandrum sativum L., Sp. Pl. ed. 1, **1**: 256 (1753)-Fl. Brit. Ind. **2**: 717 (1879)-Hiroe, Umbel. Asia **1**: 127 (1958).

Dhara Pani-Illam, cult., 1200 m (Dec. 5, 1963).

Distr. Cultivated in tropics.

Heracleum nepalense D. Don, Prodr. Fl. Nepal. 185 (1825)-Fl. Brit. Ind. **2**: 714 (1879).

Walunchung Gola-Zongi, 2900 m (Nov. 11, 1963, fr.).

var. **bivittata** C. B. Clarke in Fl. Brit. Ind. **2**: 714 (1879).

Darjeeling, 2100 m (Jun. 21, 1960, fl.); Selap-Walunchung Gola, 3000 m (Nov. 10, 1963, fr.); Batasay-Halhale Bhanjang, 2500 m (Dec. 1, 1963, fl.); Tenzing Norkay Road, Darjeeling, 2100 m (Dec. 25, 1963, fr.).

Distr. sp. E. Himalaya (Nepal, Bhutan).

Heracleum Wallichii DC., Prodr. **4**: 195 (1830)-Fl. Brit. Ind. **2**: 712 (1879).

Bilbatay Bhanjang-Tinjuray, 2800 m (Oct. 27, 1963, fr.); Hati Sar-Mangalbare, 2600 m (Oct. 28, 1963, fr.).

Distr. E. Himalaya (Nepal, Sikkim).

Hydrocotyle nepalensis Hooker, Exot. Fl. **1**: t. 30 (1823)-Hara, Enum. Sperm. Jap. **3**: 311 (1954)-Shan et Liou in Act. Phytotax. Sin. **9**: 122 (1964).

H. polycephala Wight et Arnott, Prodr. Fl. Ind. **1**: 366 (1834), e typo.

H. javanica Thunb. sensu Fl. Brit. Ind. **2**: 667 (1879), p.p.-Buwalda in Fl. Males. **4**: 115 (1949), p.p.-Hiroe et Constance, Umbel. Jap. 7, f. 2 (1958); Umbel. Asia **1**: 8 (1958), p.p.

Pamianchi-Tingling Bridge, 2000-1000 m (May 15, 1960, no. 284, fl.); Gangtok, 1600 m (Jun. 15, 1960, fl.); Birch Hill, Darjeeling, 2000 m (Jun. 18, 1960, fl.); Senchal, 2300 m (Dec. 27, 1963, fr.); Damthang–Temi, 2200 m (Mar. 25, 1963, bud); Gokarna, Kathmandu, 1500 m (Sep. 22, 1963, fl.); Sanguri Bhanjang, 1200 m (Oct. 16, 1963, fr.); Murhay, 2000 m (Oct. 23, 1963, fr.); Mul Pokhari–Gorzu Kosir, 2200 m (Oct. 30, 1963, fl.); Ghatte–Khebang, 2700–2400 m (Nov. 19, 1963, fr.); Birwa–Yektin, 2000–2900 m (Nov. 28, 1963, fr.); Mai Majuwa–Dhara Pani, 1600–1900 m (Dec. 4, 1963).

Distr. Africa, Himalaya, India, Burma, Indo-China, China, Formosa, Korea, Japan, Hawaii, Malaysia, and Australia.

On the species of this group in E. Himalaya and Japan, see a note on page 643.

Hydrocotyle podantha Molkenboer in Miquel, Pl. Jungh. 89 (1851)–Shan et Liou, l.c. 132 (1964).

H. javanica var. *podantha* (Molk.) C. B. Clarke in Fl. Brit. Ind. **2**: 668 (1879).

H. javanica Thunb. sensu Spring Fl. Sikkim Himal. f. 174 (1963).

Darjeeling, 2000–2200 m (Apr. 2 & Jun. 21, 1960 & Dec. 26, 1963, fl. & fr.); Gangtok, 1600 m (Jun. 15, 1960, fl.); Penlong La, 2100 m (Jun. 16, 1960, fl.); Dhankuta–Hilay, 1200–2000 m (Oct. 23, 1963, fr.); Sinduwa, 2100 m (Oct. 23 & 24, 1963, fl.); Bilbatay Bhanjang, 2200 m (Oct. 25, 1963, fl.); Baroya Khimty, 2500 m (Nov. 12, 1963, fl.); Mai Majuwa–Dhara Pani, 1500–1900 m (Dec. 4, 1963, fr.).

Distr. E. Himalaya (Nepal to Bhutan), India, W. China, and Malaysia.

Hydrocotyle sibthorpioides Lamarck, Encycl. Méth. **3**: 153 (1789)–Hara, Enum. Sperm. Jap. **3**: 312 (1954)–Hiroe, Umbel. Asia **1**: 10 (1958), p.p.–Shan et Liou, l.c. 125 (1964).

H. rotundifolia Roxburgh ex DC., Prodr. **4**: 64 (1830)–Fl. Brit. Ind. **2**: 668 (1879).

Takdah Forest Bungalow, 1600 m (Apr. 19, 1960, no. 1978, fl.); Minchin Dhap–Mul Pokhari, 2900–2500 m (Oct. 29, 1963, fl.).

Distr. India to China, Korea, Japan, Malaysia, and Australia.

Our collections differ from typical *H. sibthorpioides* by more deeply lobed leaves with open basal sinus, and fewer-flowered umbels. In the leaves, they agree well with *H. nitidula* Rich. and *H. japonica* Makino, but lack white thickened hibernating rhizomes characteristic to the latter.

Oenanthe Thomsoni C. B. Clarke in Fl. Brit. Ind. **2**: 697 (1879)–Chermez in Fl. Gén. Ind.-Chin. **2**: 1150 (1923).

Palmajua–Rimbick, 2300–2200 m (May 5, 1960, fl.); Tingling Bridge–Yoksam, 1000–1700 m (May 16, 1960, fl.); Yoksam, 1700 m (May 17, 1960, fl.); Gangtok, 1600 m (Jun. 15, 1960, fl.); Darjeeling, 2000–2100 m (Jun. 19 & 22, 1960, fl.; Sep. 22, 1964, fr.); Minchin Dhap–Mul Pokhari, 2700 m (Oct. 29, 1963, fl.) Taplejung–Heydewa, 1800 m (Nov. 3, 1963, fr.); Chyangthaphu–Birwa, 2000 m (Nov. 27, 1963, st.); Mai Pokhari, 1700 m (Dec. 4, 1963, fr.).

Distr. E. Himalaya (Nepal, Sikkim, Bhutan), Khasia, Indo-China, and China.

Pimpinella diversifolia DC., Prodr. **4**: 122 (1830)–Fl. Brit. Ind. **2**: 688 (1879)–Wolff in Pfl.-reich IV-228, Ht. **90**: 269 (1927)–Hara, Enum. Sperm. Jap. **3**: 319 (1954)–Hiroe, Umbel. Jap. 46 (1958); Umbel. Asia **1**: 67 (1958).

Murhay, 2000 m (Oct. 23, 1963, fr.); Sinduwa, 2100 m (Oct. 24, 1963, fl. & fr.); near Sinduwa, 2100 m (Oct. 24, 1963, fr.); Bilbatay Bhanjang, 2200 m & 2700 m (Oct.

26, 1963, fr.); Minchin Dhap–Mul Pokhari, 2700 m (Oct. 29, 1963, fr.); Thakma Khola–Diorali Bhanjang, 3200 m (Nov. 14, 1963, fr.); Diorali Bhanjang–Bhandukay, 3000 m & 2800 m (Nov. 14, 1963, fr.); Diorali Bhanjang–Yamphodin, 2500 m & 2700 m (Nov. 17, 1963, fr.); Batasay–Halhale Bhanjang, 2400 m (Dec. 1, 1963, fr.); Lagyap, Gangtok, 2200 m (Sep. 13, 1964, fr.).

Distr. Afghanistan, Himalaya, Khasia, Burma, China, Formosa, and Japan.

The Himalayan plant is large in size, sometimes attaining 1.6 m high, with long stolons. Its stems and leaves are often dark purplish. The shape of leaflets and the hairiness are so variable that there is no distinct difference from Japanese, Formosan, and Chinese specimens, except for the shape of upper cauline leaves which are deeply dissected or pinnately parted in the latters while they are not dissected in the former.

Sanicula elata Hamilt. in D. Don, Prodr. Fl. Nepal 183 (1825)–Hiroe, Umbel. Asia **1**: 16 (1958).

S. europaea L. var. *elata* (Ham.) Wolff in Engl., Pfl.-reich IV-228, Ht. **61**: 63 (1913).

S. europaea L. sensu C. B. Clarke in Fl. Brit. Ind. **2**: 670 (1879).

Birch Hill, Darjeeling, 2000 m (Apr. 5, 1960); Senchal, Darjeeling, 2300 m (Apr. 6, 1960, fl.); Kurseong, 1550 m (Apr. 12, 1960, fl.); Batasi, 2000 m (May 2, 1960, fl.); Batasi–Palmajua, 2300–2100 m (May 3, 1960, fl.); Garibans–Tonglu, 2800–3000 m (Jun. 7, 1960, fl.); Gangtok, 1600 m (Jun. 15, 1960, fl.); Penlong La, 2100 m (Jun. 16, 1960, fl.); Ghum–Lopchu, 2000 m (Jun. 19, 1960, fl.); Murhay, 2100 m (Oct. 23, 1963, fr.); Bilbatay Bhanjang–Tinjuray, 2600 m (Oct. 27, 1963, fr.); Minchin Dhap–Mul Pokhari, 2700 m (Oct. 29, 1963, fr.); Taplethok–Helok, 1500 m (Nov. 6, 1963, fr.); Helok, 1500 m (Nov. 9, 1963, fr.); Iladanda–Selap, 2200 m (Nov. 9, 1963, fr.); Ghatte, 1300 m (Nov. 17, 1963, fr.); Birwa–Yektin, 2000 m (Nov. 28, 1963, fr.).

Distr. Africa, Himalaya, India, Ceylon, Burma, Indo-China, and China.

This species is closely related to *S. chinensis* Bunge (see page 644).

Selinum Candollii DC., Prodr. **4**: 165 (1830)–Fl. Brit. Ind. **2**: 700 (1879)–Hiroe, Umbel. Asia **1**: 154 (1958).

Angelica Candollei Wall., Cat. no. 582 (1828), nom. nud.

Peucedanum Wallichianum DC., Prodr. **4**: 181 (1830).

Sinduwa, 2100 m (Oct. 24, 1963, fl. & fr.); Bilbatay Bhanjang–Tinjuray, 2800 m (Oct. 27, 1963, fl.); Mangalbare–Lam Pokhari, 2700 m (Oct. 28, 1963, fl. & fr.); Walunchung Gola, 3500 m (Nov. 11, 1963, fr.); Thakma Khola–Diorali Bhanjang, 3200 m (Nov. 17, 1963, fr.); Siling Tzokupa, 2900 m & 2700 m (Nov. 21, 1963, fl. & fr.); Sandakphu, 3600 m (Sep. 17, 1964, fl.).

Distr. Himalaya (Kashmir to Nepal).

Torilis japonica (Houtt.) DC., Prodr.' **4**: 219 (1830)–Hara, Enum. Sperm. Jap. **3**: 328 (1954)–Hiroe, Umbel. Asia **1**: 35 (1958).

Tordylium Anthriscus L., Sp. Pl. ed. 1, **1**: 240 (1753).

Caucalis Anthriscus (L.) Huds., Fl. Angl. 99 (1762)–Fl. Brit. Ind. **2**: 718 (1879).

C. japonica Houtt., Nat. Hist. II, **8**: 42, t. 45, fig. 1 (1777).

Taplethok–Helok, 1500 m (Nov. 6, 1963, fl.); Ghatte–Khebang, 2000 m (Nov. 19, 1963, fl.); Khebang–below Siling Tzokupa, 1800 m (Nov. 20, 1963, fr.).

Distr. Himalaya, India, Burma, Indo-China, China, Formosa, Korea, Japan, and Sumatra.

Vicatia coniifolia DC., Prodr. **4**: 243 (1830)–Fl. Brit. Ind. **2**: 671 (1879)–Hiroe, Umbel. Asia **1**: 96 (1958).

Kakani Hill, 2000 m (Sep. 24, 1963, fr.); Zongi–Ilandanda, 2000 m (Nov. 12, 1963, fr.).

Distr. Himalaya (Baltistan to Nepal).

CORNACEAE (by Hiroshi Hara)

Aucuba himalaica Hook. f. et Thoms. ex Hook. f., Ill. Himal. Pl. t. 12 (1855)–Fl. Brit. Ind. **2**: 747 (1879)–Wangerin in Pfl.-reich IV-229, Ht. **41**: 41 (1910)–Spring Fl. Sikkim Himal. f. 141 & 142 (1963).

Chia Bhanjang–Dentam, 3100–2500 m (May 11, 1960, no. 202, fl. & fr.); Batasi–Palmajua, 2300–2600 m (May 3, 1960, fl.); Palmajua–Rimbick, 1500–2200 m (May 5, 1960, fr.).

Distr. E. Himalaya (Sikkim to N. Assam), Manipur, and N. Burma.

The relationships between this species, *A. chinensis* Benth, and *A. japonica* Thunb. are given in detail on page 644.

Helwingia himalaica Hook. f. et Thoms. ex C. B. Clarke in Fl. Brit. Ind. **2**: 726 (1879)–Wangerin, l.c. 37 (1910)–Rehder in Pl. Wilson. **2**: 571 (1916)–Li in Taiwania **1**: 95 (1948)–Fang in Act. Phytotax. Sin. **1**: 168 (1951). [Pl. 4 a]

H. himalaica var. *lanceolata* Deb in Bull. Bot. Surv. India **3**: 273 (1962).

Near Ghum, 2300 m (Apr. 4, 1960; Apr. 2, 1963, bud); Batasi–Palmajua, 2300–2600 m (May 3, 1960, fl.); Palmajua–Rimbick, 1500–2200 m (May 5, 1960, fl.); Garibans–Tonglu, 2800–3000 m (Jun. 7, 1960, fl.); Chia Bhanjang–Dentam (May 11, 1960, no. 208, fl.); near Hati Sar, 2700 m (Oct. 27, 1963, fr.); Hati Sar–Lam Pokhari, 2700–2900 m (Oct. 28, 1963); Minchin Dhap–Mul Pokhari, 2900–2500 m (Oct. 29, 1963, fr.); below Siling Tzokupa, 2400 m (Nov. 21, 1963); Kaulepati Bhanjang, 2300 m (Nov. 27, 1963); Bhuspate Danra, 2800 m (Dec. 2, 1963).

Distr. E. Himalaya (C. Nepal to NEFA), Khasia, Manipur, and N. Burma.

Confer a critical note on the genus on page 645.

Toricellia tiliaefolia DC., Prodr. **4**: 257 (1830)–Fl. Brit. Ind. **2**: 748 (1879)–Wangerin, l.c. 31 (1910)–Rehder in Pl. Wilson. **2**: 569 (1916).

Tingling Bridge, 1000 m (May 15, 1960, nos. 267, 268 & 280, fl. & fr.).

Distr. E. Himalaya (Nepal to Bhutan), and W. China (Yunnan, Kweichow).

PYROLACEAE (by Hiroshi Hara)

Monotropa uniflora L., Sp. Pl. ed. 1, **1**: 387 (1753)–Fl. Brit. Ind. **3**: 476 (1882), p.p.–Hara, Enum. Sperm. Jap. **1**: 3 (1949); in Journ. Fac. Sci. Univ. Tokyo Bot. **6**: 349 (1956).

Above Helok, 1700 m (Nov. 8 & 14, 1963, fr.).

Distr. Himalaya (Punjab to Bhutan), Khasia, Naga Hills, W. & C. China, Formosa, Korea, Japan, and N. America.

Monotropastrum humile (D. Don) Hara in Journ. Jap. Bot. **36**: 78, f. 2 (1961); **40**: 100 (1965)–Spring Fl. Sikkim Himal. f. 155 & 156 (1963).

Monotropa humilis D. Don, Prodr. Fl. Nepal. 151 (1825).

M. nepalensis Wallich, Cat. no. 7252 (1832), nom. nud.

M. uniflora L. sensu Fl. Brit. Ind. **3**: 476 (1882), p.p.

Monotropastrum macrocarpum H. Andres in Notizbl. Bot. Gart. **12**: 698 (1935), sine diagn. latin.; in Hand.-Mzt., Symb. Sin. **7**: 766, f. 23 (1936).

Monotropastrum ampullaceum H. Andres, l.c. 698 (1935), sine diagn. latin.

Monotropastrum pumilum H. Andres in Engl., Bot. Jahrb. **76**: 103, f. 1 (1953).

Monotropastrum Clarkei H. Andres, l.c. 105 (1953), sine diagn. latin.

Tiger Hill, Darjeeling, 2480 m (Jun. 23, 1960, fl.).

Distr. sp. Himalaya (Kumaon to Bhutan), S. Tibet, Khasia, Manipur, N. Burma, Indo-China, W. & C. China, Formosa, Korea, S. Ussuri, S. Saghalin, and Japan.

Critical notes on this species, and on the relationship between *Monotropa* and *Monotropastrum* have been given in my previous papers in 1941, 1961 and 1965, and also on page 647.

ERICACEAE (by Hiroshi Hara)

Agapetes incurvata (Griff.) Sleumer in Engl., Bot. Jahrb. **70**: 105 (1939)–Airy-Shaw in Kew Bull. **1948**: 99 (1948); **1958**: 485 (1959).

Gaylussacia incurvata Griffith, Icon. Pl. Asia. t. 506 (1854).

var. **Hookeri** (C. B. Clarke) Airy-Shaw in Kew Bull. **1958**: 486 (1959).

Pentapterygium Hookeri C. B. Clarke in Fl. Brit. Ind. **3**: 450 (1882).

Agapetes Hookeri (C. B. Clarke) Sleumer, l.c. 106 (1939)–Airy-Shaw in Kew Bull. **1948**: 98 (1948).

Dentam–Pamianchi, 1500–2000 m (May 12, 1960); Darjeeling, 2200 m (Jun. 21, 1960 & Sep. 22, 1964, fl. yellow); Senchal–Tiger Hill, 2400–2500 m (Jun. 23, 1960, fl., pedicel glabrous); Sinduwa, 2100 m (Oct. 24, 1963, fr.); above Tutay, 2700 m (Oct. 26, 1963, fr.); Minchin Dhap–Mul Pokhari, 2700–2900 m (Oct. 29, 1963, fr.); below Siling Tzokupa, 2800 m (Nov. 21, 1963, fr.); Kaulepati Bhanjang, 2300 m (Nov. 27, 1963, fr.); Birwa-Yektin, 2900–1600 m (Nov. 28, 1963, fr.); Halhale Bhanjang, 2700 m (Dec. 1, 1963, fr.); Bhandukay Bhanjang–Mai Majuwa, 2000–2600 m (Dec. 3, 1963, fr.).

Distr. E. Himalaya (E. Nepal, Sikkim).

All of our collections from E. Nepal have relatively shorter pedicels which are patently puberulous.

Agapetes saligna (Hook. f.) Hooker f. in Benth. et Hook. f., Gen. Pl. **2**: 571 (1876)–Fl. Brit. Ind. **3**: 444 (1881)–Airy-Shaw in Kew Bull. **1948**: 80 (1948); **1958**: 477 (1959).

Vaccinium salignum Hook. f., Ill. Himal. Pl. t. 15, fig. A (1855).

Dentam, 1300–1400 m (May 11, 1960, no. 177, defl.); Gangtok–Saramsa Medicinal Garden, 1500–1100 m (Jun. 17, 1960, defl.); Zalipur, 1000 m (Sep. 12, 1964).

Distr. E. Himalaya (Sikkim, Bhutan), and N. Burma?

Agapetes serpens (Wight) Sleumer in Engl., Bot. Jahrb. **70**: 105 (1939)–Airy-Shaw, l.c. 102 (1948); l.c. 499 (1959).

Vaccinium serpens Wight in Calcut. Journ. Nat. Hist. **8**: 171 (1847); Icon. **4** (1): 4, t. 1183 (1848).

Pentapterygium serpens (Wight) Klotzsch in Linnaea **24**: 47 (1851)–Fl. Brit. Ind. **3**: 449 (1882).

Darjeeling, 2000–2200 m (Apr. 3, 1960, fl.); Mani Bhanjang–Batasi, 2000–2100 m (May 1, 1960, fl.); Penlong La, Gangtok, 2100 m (Mar. 18, 1963, fl.); Damthang–Temi, 2200–1800 m (Mar. 25, 1963, fl.); Sinduwa, 2100 m (Oct. 23, 1963); Baroya Khimty, 2500 m (Nov. 10, 1963, fl.); Tharpu–Chyangthaphu, 1200–1300 m (Nov. 26, 1963, fl.); Yektin–Batasay, 1400–2400 m (Nov. 30, 1963, fl.); Bhandukay Bhanjang, 3000 m (Dec. 3, 1963, fl.); Mai Majuwa–Dhara Pani, 1500–1700 m (Dec. 4, 1963, fl.).

Distr. E. Himalaya (E. Nepal to NEFA).

Agapetes Smithiana Sleumer in Engl., Bot. Jahrb. **70**: 106 (1939)–Airy-Shaw in Kew Bull. **1948**: 101 (1948); **1958**: 489 (1959).

Pentapterygium sikkimense W. W. Smith in Rec. Bot. Surv. India **4**: 268 (1911).

Batasi–Palmajua, 2100–2300 m (May 3, 1960, no. 40 A defl.); Tendong Peak, 2750 m (Mar. 26, 1963, fl. yellow); Baroya Khimty, 2500 m (Nov. 10, 1963, bud); Zongi–Iladanda, 2800–1800 m (Nov. 12, 1963, fr. & bud); Birwa–Yektin, 2000–1600 m (Nov. 28, 1963); Bhandukay Bhanjang–Mai Majuwa, 3100–1700 m (Dec. 3, 1963, bud).

Distr. E. Himalaya (E. Nepal, Sikkim).

Cassiope fastigiata (Wall.) D. Don in Edinb. New Philos. Journ. **17**: 157 (1834)–Fl. Brit. Ind. **3**: 459 (1882)–Rehder, Man. ed. 2, 731 (1940)–Spring Fl. Sikkim Himal. f. 12 (1963).

Andromeda fastigiata Wallich in Asiat. Research. **13**: 394 (1820).

Bakkim–Jongri, 3500–4000 m (May 19, 1960, no. 356, fl.); Jongri, 4000–4200 m (May 21–23, 1960, no. 437, fl.); Gamothang, 3750 m (May 29, 1960, fl.).

Distr. Himalaya (Kashmir to Bhutan).

Enkianthus deflexus (Griff.) Schneider, Ill. Handb. Laubh. **2**: 521 (1911)–Pl. Wilson. **1**: 550 (1913)–Rehder, Man. ed. 2, 730 (1940); Bibl. 528 (1949)–Kanai in Journ. Fac. Sci. Univ. Tokyo Bot. **8**: 330 (1963).

Rhodora deflexa Griffith, Itin. Not. 148 & 187 (1848).

Enkianthus himalaicus Hook. f. et Thoms. in Hook. Journ. Bot. Kew Gard. Misc. **7**: 125, t. 3 (1855)–Fl. Brit. Ind. **3**: 461 (1882).

Meisteria deflexa (Griff.) Nakai in Bot. Mag. Tokyo **38**: 39 (1924).

Batasi–Palmajua, 2400–2600 m (May 3, 1960, fl.); Chia Bhanjang–Phalut, 3100–3200 m (Jun. 2, 1960, fl.); Minchin Dhap–Mul Pokhari, 2700–2500 m (Oct. 29, 1963, fr.); Walunchung Gola–Zongi, 3800–2800 m (Nov. 11, 1963, fr.); Thakma Khola–Diorali Bhanjang, 3200–3400 m (Nov. 14, 1963, fr.); Siling Tzokupa, 2800 m (Nov. 21, 1963, fr.); Birwa–Yektin, 2900–1600 m (Nov. 28, 1963, fr.).

Distr. E. Himalaya (Nepal to NEFA), S. Tibet, N. Burma, and W. China.

Gaultheria fragrantissima Wallich in Asiat. Research. **13**: 397, fig. (1820)–Fl. Brit. Ind. **3**: 457 (1882)–Airy-Shaw in Kew Bull. **1952**: 174 (1952).

Sunderijal Waterfall, 1600 m (Sep. 20, 1963, fr.); Kakani, 2100–2200 m (Sep. 24, 1963, fr.); Helok–Lelep, 2200 m (Nov. 9, 1963, bud); Iladanda–Helok, 1800–1500 m (Nov. 13, 1963, bud); Helok–Baroya Khimty, 1500–2500 m (Nov. 15, 1963, fl.); below Siling Tzokupa, 2100–3100 m (Nov. 21, 1963); Akasay–Batasay, 2300–2400 m (Nov. 30, 1963, fr.).

Distr. E. Himalaya (Nepal to Bhutan), Khasia, and N. Burma.

Gaultheria Griffithiana Wight in Calcut. Journ. Nat. Hist. **8**: 176 (1847); Icon. **4** (1): 6, t. 1197 (1848)–Fl. Brit. Ind. **3**: 458 (1882)–Airy-Shaw in Kew Bull. **1952**: 173 (1952).

Chia Bhanjang–Dentam, 3100–1400 m (May 11, 1960, no. 201, fl.); below Bakkim, 2200 m (May 19, 1960, no. 426, fl.); Diorali Bhanjang–Bhandukay, 3500–2500 m (Nov.

14 & 17, 1963, fr. blue-black).

Distr. E. Himalaya (Nepal to NEFA), Khasia, N. Burma, and W. China (Yunnan, Szechuan).

Gaultheria nummularioides D. Don, Prodr. Fl. Nepal. 150 (1825)-Royle, Ill. Bot. Himal. t. 63, f. 2 a-e (1835)-Fl. Brit. Ind. **3**: 457 (1882)-Airy-Shaw in Kew Bull. **1940**: 314 (1941)-Rehder, Bibl. 534 (1949).

Victoria Fall, Darjeeling, 2000 m (Apr. 3, 1960, fr.); Ghum, 2300 m (Apr. 4, 1960, fr.); Batasi-Palmajua, 2300–2600 m (May 3, 1960, no. 83, fr.); Phalut-Chia Bhanjang, 3300 m (May 11, 1960, no. 190, defl.); Garibans-Tonglu, 2800–3000 m (Jun. 7, 1960, fr.); above Tutay, 2700 m (Oct. 26, 1963); Bilbatay Bhanjang-Hati Sar, 2700–2900 m (Oct. 27, 1963, fr.); Minchin Dhap-Mul Pokhari, 2900–2500 m (Oct. 29, 1963, fr.); Helok-Lelep, 2400 m (Nov. 9, 1963, fr.); Iladanda-Helok, 1800–1500 m (Nov. 13, 1963, fr.); Thakma Khola, 3200–3400 m (Nov. 14 & 16, 1963, fr.); Halhale Bhanjang-Bhuspate Danra, 2700–2800 m (Dec. 1, 1963, fr.).

Distr. Himalaya, Khasia, W. China, and Malaysia (Java, Sumatra).

Gaultheria pyroloides Hook. f. et Thoms. ex Miquel, Ann. Mus. Bot. Lugd.-Bat. **1**: 30 (1863), quoad pl. Sikkim, emend. Takeda in Bot. Mag. Tokyo **32**: 195 (1918)-Sealy in Bot. Mag. sub t. 9629 (1941)-Rehder, Bibl. 534 (1949)-Spring Fl. Sikkim Himal. f. 14 (1963).

G. pyrolaefolia Hooker f. ex C. B. Clarke in Fl. Brit. Ind. **3**: 457 (1882)-Merrill in Brittonia **4**: 151 (1941).

Sandakphu-Phalut, 3300–3600 m (May 8 & Jun. 6, 1960, fl.); Migothang-Nayathang, 3900–3300 m (Jun. 1, 1960, no. 720, fl.); Nayathang-Chia Bhanjang, 3300–3100 m (Jun. 2, 1960, no. 740, fl.); Thakma Khola-Diorali Bhanjang, 3200–3400 m (Nov. 14, 16 & 17, 1963, fr.).

Distr. E. Himalaya (Nepal, Sikkim), S. Tibet, N. Burma, and W. China.

Gaultheria semi-infera (C. B. Clarke) Airy-Shaw in Kew Bull. **1940**: 317 (Feb. 1941), in nota; **1952**: 173 (1952).

Diplycosia? semi-infera C. B. Clarke in Fl. Brit. Ind. **3**: 459 (1882).

Senchal, 2400 m (Apr. 6, 1960, fr.); Rimbick-Ramam, 1900–2400 m (May 7, 1960, fr.); Bilbatay Bhanjang-Hati Sar, 2500–2900 m (Oct. 27, 1963, fr.); Minchin Dhap-Mul Pokhari, 2900–2500 m (Oct. 29, 1963, fr.); Taplejung-Garhi Danra, 1900–2200 m (Nov. 3, 1963, fr.); Siling Tzokupa, 2700 m (Nov. 21, 1963, fr.); Birwa-Yektin, 2900–1600 m (Nov. 28, 1963, fr.); Darjeeling, 2200 m (Dec. 26, 1963, fr.).

Distr. E. Himalaya (Nepal to Bhutan), N. Burma, and Yunnan.

The fruits are edible, and are variable in colour and size. They are generally dark blue or whitish, rarely violet, and the whitish ones are often larger and good to eat.

Gaultheria trichophylla Royle, Ill. Bot. Himal. t. 63 a-e (Aug. 1835), 260 (Dec. 1835)-Fl. Brit. Ind. **3**: 457 (1882)-Airy-Shaw in Kew Bull. **1941**: 323 (1941)-Rehder, Bibl. 535 (1949).

Sandakphu-Phalut, 3300–3600 m (May 8, 1960, fl.); Ramam-Phalut, 2400–3500 m (May 9, 1960, no. 162); Bakkim-Jongri, 2500–4000 m (May 19, 1960, no. 384, fl.); Phalut-Chia Bhanjang, 3300 m (May 11, 1960, fl.); Jongri-Olothang, 4000 m (May 23, 1960, fl.); Jongri, 4000 m (May 23, 1960); Nayathang-Chia Bhanjang (Jun. 2, 1960, fl.); Hati Sar-Minchin Dhap, 2700–2900 m (Oct. 28, 1963); Diorali Bhanjang, 3400 m (Nov. 14, 1963); Siling Tzokupa, 3000 m (Nov. 21, 1963).

Distr. sp. Himalaya (Kashmir to Bhutan), S. Tibet, N. Burma, and W. China (Yunnan, Szechuan).

Lyonia ovalifolia (Wallich) Drude in Engl., Pfl.-fam. IV, **1**: 44 (1889)-Hand.-Mzt., Symb. Sin. **7**: 788 (1936)-Rehder, Man. ed. 2, 734 (1940); Bibl. 532 (1949)-Kitamura, Faun. & Fl. Nepal Himal. 191 (1955).

Andromeda ovalifolia Wallich in Asiat. Research. **13**: 391, t. 11 (1820).

Pieris ovalifolia (Wall.) D. Don in Edinb. New Philos. Journ. **17**: 159 (1834)-Rehder et Wilson in Pl. Wilson. **1**: 552 (1913).

Xolisma ovalifolia (Wall.) Rehder in Journ. Arn. Arb. **5**: 52 (1924); **15**: 281 (1934); **18**: 230 (1937)-Nakai, Tr. & Shr. ed. 2, 206 (1927).

Batasi–Palmajua, 2300–2600 m (May 3, 1960, no. 69, bud); Palmajua–Rimbick, 1500–2200 m (May 5, 1960, bud); Phalut–Dentam, 3500–1400 m (May 11, 1960, no. 176, fl.); Pamianchi–Tingling Bridge, 2000–1000 m (May 15, 1960, no. 269, fl.); Darjeeling, 2000–2200 m (Jun. 19 & 26, 1960, fl., fr.); Sunderijal Waterfall, Kathmandu, 1600 m (Sep. 20, 1963); Dhankuta, 1200 m (Oct. 20 & 21, 1963, fr.); Minchin Dhap–Mul Pokhari, 2900–2500 m (Oct. 29, 1963, fr.); Taplejung, 1700 m (Nov. 2, 1963, fr.); Tuwa–Taplethok, 1800–1400 m (Nov. 5, 1963, fr.); Selap–Walunchung Gola, 2600–3800 m (Nov. 10, 1963, fr.); Ghatte–Khebang, 1600–2400 m (Nov. 19, 1963, fr.); below Siling Tzokupa, 2400 m (Nov. 21, 1963); Khebang, 1700 m (Nov. 23, 1963, fr.).

Distr. Himalaya (Kashmir to NEFA), Khasia, Manipur, Burma, N. Thai, Indo-China, Malay Penin., and W. China.

Our Himalayan collections are very variable in the size of leaves and flowers. For further informations, see page 648.

Lyonia villosa (Hook. f.) Hand.-Mzt., Symb. Sin. **7**: 789 (1936).

Pieris villosa Hooker f. ex C. B. Clarke in Fl. Brit. Ind. **3**: 461 (1882).

Xolisma villosa (Hook. f.) Rehder in Journ. Arn. Arb. **5**: 53 (1924).

Phalut–Sandakphu, 3500 m (Jun. 6, 1960, no. 670, fl.); Sandakphu–Garibans, 3500–2800 m (Jun. 7, 1960, no. 702, fl.);

Distr. Himalaya (Garhwal to Sikkim), and W. China (Szechuan, Yunnan).

Pieris formosa (Wall.) D. Don in Edinb. New Philos. Journ. **17**: 159 (1834)-Fl. Brit. Ind. **3**: 461 (1882)-Bot. Mag. t. 8283 (1909)-Rehder, Man. ed. 2, 732 (1940); Bibl. 530 (1949)-Kitamura, Faun. & Fl. Nepal Himal. 191 (1955).

Andromeda formosa Wallich in Asiat. Research. **13**: 395 (1820).

Lyonia formosa (Wall.) Hand.-Mzt., Symb. Sin. **7**: 790 (1936).

Batasi–Palmajua, 2300–2600 m (May 3, 1960, no. 33, fl.); Rimbick–Ramam, 1900–2400 m (May 7, 1960, no. 133, fr.); Minchin Dhap–Mul Pokhari, 2900–2500 m (Oct. 29, 1963, bud & old fr.); Baroya Khimty, 2500 m (Nov. 10 & 11, 1963); Zongi–Iladanda, 2800–1800 m (Nov. 12, 1963); Siling Tzokupa, 2500–3000 m (Nov. 21, 1963); Birwa–Yektin, 2900–2000 m (Nov. 28, 1963); Yektin–Akasay, 1500–2300 m (Nov. 30, 1963); Halhale Bhanjang, 2800 m (Dec. 1, 1963); Bhuspate Danra, 2900 m (Dec. 2, 1963).

Distr. E. Himalaya (Nepal to NEFA), Khasia, Manipur, N. Burma, and W. & C. China.

The species is closely allied to *P. taiwanensis* Hayata of Formosa, and *P. japonica* (Thunb.) D. Don of Japan.

Rhododendron Anthopogon D. Don in Mem. Wern. Nat. Hist. Soc. **3**: 409

(1821)-Fl. Brit. Ind. **3**: 472 (1882), p.p.-Sp. Rhod. 5, fig. (1930)-Spring Fl. Sikkim Himal. f. 41 & 42 (1963).

Bakkim-Jongri, 3800-4000 m (May 19, 1960, no. 352, fl.); Jongri, 4000-4200 m (May 21, 1960, fl.); Jongri-Gamothang, 4200-3600 m (May 26, 1960, no. 496, fl.); Gamothang-Migothang, 3800-4400 m (May 30, 1960, no. 588, fl.).

Distr. E. Himalaya (Nepal to Bhutan), and S. Tibet.

The colour of flowers varies from rose to white, and rarely pale yellow by individual. The leaves are dried and used as incense.

Rhododendron arboreum Smith, Exot. Bot. **1**: 9, t. 6 (1805)-Fl. Brit. Ind. **3**: 465 (1882)-Sp. Rhod. 14, fig. (1930)-Cowan in Not. Bot. Gard. Edinb. **19**: 159 (1936).

Birch Hill, Darjeeling, 2000 m (Apr. 7, 1960, fl.); Rimbick-Ramam, 1900-2400 m (May 7, 1960, defl.); Bilbatay Bhanjang, 2200 m (Oct. 25, 1963, fr.); Baroya Khimty, 2500 m (Nov. 11, 1963, fr.); Thakma Khola, 3000 m (Nov. 12, 1963, fr.); Tharpu-Chyangthaphu, 1200-1300 m (Nov. 26, 1963, fr.); Chyangthaphu-Birwa, 1300-2400 m (Nov. 27, 1963, fr.); Birwa-Yektin, 2900-1600 m (Nov. 28, 1963, fl.).

var. **Campbelliae** (Hook. f.) Hook. f. ex Lacaita in Journ. Linn. Soc. **43**: 472 (1916), nom. nud.-Spring Fl. Sikkim Himal. f. 62 & 63 (1963).

R. Campbelliae Hook. f., Rhod. Sikkim Himal. t. 6 (1849).

Sandakphu-Phalut, 3300-3600 m (May 8, 1960, fl.); Ramam, 2400-2800 m (May 8, 1960, no. 147, fl.); Chia Bhanjang-Phalut, 3100-3500 m (Jun. 2, 1960, fl.); above Tutay, 2700 m (Oct. 26, 1963, fr.); Hati Sar-Minchin Dhap, 2700-2900 m (Oct. 28, 1963, bud); Selap-Walunchung Gola, 2600-3800 m (Nov. 10, 1963, fr.).

Distr. sp. Himalaya (Kashmir to NEFA), S. Tibet, Khasia, Naga Hills, Manipur, and Burma.

The flowers are crimson, deep rose, rose, or rarely white. Var. *Campbelliae* differs from typical *R. arboreum* in having brown-tomentose young branches and petioles, and less pointed leaves brown-tomentose beneath and rounded or subcordate at the base, and it occurs at higher altitudes.

Rhododendron barbatum Wallich [Cat. no. 757 (1829), nom. nud.] ex G. Don, Gen. Hist. **3**: 844 (1834)-Hook. f., Rhod. Sikkim Himal. t. 3 (1849)-Fl. Brit. Ind. **3**: 468 (1882)-Sp. Rhod. 129, fig. (1930).

Sandakphu-Phalut, 3300-3600 m (May 8, 1960, fl.); Ramam, 2400-2800 m (May 8, 1960, defl.); Phalut-Chia Bhanjang, 3500-3100 m (May 11, 1960, no. 195, fl.); Bakkim-Jongri, 2500-4000 m (May 19, 1960, no. 382, fl.); Tinjuray, 2700-2800 m (Oct. 27, 1963); Hati Sar-Minchin Dhap, 2700-2900 m (Oct. 28, 1963, fr.); Minchin Dhap-Mul Pokhari, 2900-2500 m (Oct. 29, 1963, fr.); Walunchung Gola-Zongi, 3100 (Nov. 11, 1963, fr.); Thakma Khola, 3200 m (Nov. 13, 1963, fr.); Diorali Bhanjang, 3200-3500 m (Nov. 14, 1963, fr.); Siling Tzokupa, 2800 m (Nov. 21, 1963, fr.).

Distr. Himalaya (Kumaon to Bhutan).

A non-bristly form was found around Minchin Dhap.

Rhododendron camelliaeflorum Hooker f., Rhod. Sikkim Himal. t. 28 (1851)-Fl. Brit. Ind. **3**: 470 (1882)-Sp. Rhod. 173, fig. (1930).

Minchin Dhap-Mul Pokhari, 2900-2500 m (Oct. 29, 1963, fr.); Baroya Khimty-Thakma Khola, 2700 m (Nov. 12 & 16, 1963, fr.).

Distr. E. Himalaya (Nepal to Bhutan), and S. Tibet.

Rhododendron campanulatum D. Don in Mem. Wern. Nat. Hist. Soc. **3**:

410 (1821)-Fl. Brit. Ind. **3**: 466 (1882).

var. **Wallichii** (Hook. f.) Hook. f. ex C. B. Clarke in Fl. Brit. Ind. **3**: 466 (1882)-Spring Fl. Sikkim Himal. f. 44 (1963).

R. Wallichii Hook. f., Rhod. Sikkim Himal. t. 5 (1849)-Sp. Rhod. 181, fig. (1930).

Sandakphu, 3600 m (May 7, 1960, fl.; Sep. 16, 1964, fr.); Sandakphu-Phalut, 3300–3600 m (May 8 & Jun. 6, 1960, fl.); Ramam-Phalut, 3400 m (May 9, 1960, no. 119 & 160, fl.); Bakkim-Jongri, 3700–4000 m (May 19, 1960, no. 354, fl.); Jongri-Olothang, 3800–4000 m (May 23, 1960, no. 466 & 467, fl.); Jongri-Gamothang, 4200–3600 m (May 26, 1960, no. 506, fl.); Migothang-Nayathang, 3900–3300 m (Jun. 1, 1960, fl.); Walunchung Gola-Zongi, 3800–2800 m (Nov. 11, 1963).

Distr. sp. Himalaya (Kashmir to Bhutan), and S. Tibet.

The density of pubescence on the under surface of leaves is variable.

Rhododendron campylocarpum Hooker f., Rhod. Sikkim Himal. t. 30 (1851)-Fl. Brit. Ind. **3**: 467 (1882)-Sp. Rhod. 702, fig. (1930)-Spring Fl. Sikkim Himal. f. 43 (1963).

Bakkim-Jongri, 3800–4000 m (May 19, 1960, no. 620, fl. yellow); Migothang-Nayathang, 3900–3300 m (Jun. 1, 1960, no. 719, fl.); Nayathang-Chia Bhanjang, 3200–3600 m (Jun. 2, 1960, no. 739, fl. light yellow).

Distr. E. Himalaya (Nepal to Bhutan), and S. Tibet.

Rhododendron ciliatum Hooker f., Rhod. Sikkim Himal. t. 24 (1851)-Fl. Brit. Ind. **3**: 470 (1882)-Sp. Rhod. 455 (1930).

Siling Tzokupa, 2700 m (Nov. 21, 1963, bud).

Distr. E. Himalaya (E. Nepal, Sikkim), and S. Tibet.

Rhododendron cinnabarinum Hooker f., Rhod. Sikkim Himal. t. 8 (1849)-Fl. Brit. Ind. **3**: 474 (1882)-Sp. Rhod. 222 (1930)-Spring Fl. Sikkim Himal. f. 52 (1963).

R. Roylii Hooker f., l.c. t. 7 (1849).

Rimbick-Ramam, 1900–2400 m (May 7, 1960, fl.); Sandakphu-Phalut, 3300–3600 m (May 8 & Jun. 6, 1960, fl.); Bakkim-Jongri, 2500–4000 m (May 19, 1960, no. 386 & 614, fl.); Migothang-Nayathang, 3900–3300 m (Jun. 1, 1960, no. 709 & 728, fl.); Phalut, 3500 m (Jun. 3, 1960, no. 639, fl.); Lam Pokhari, 2900 m (Oct. 28, 1963); Minchin Dhap-Mul Pokhari, 2900–2500 m (Oct. 29, 1963, fr.); Walunchung Gola-Zongi, 3800–2800 m (Nov. 11, 1963, fr.).

Distr. E. Himalaya (Nepal to Bhutan), and S. Tibet.

Rhododendron Dalhousiae Hooker f., Rhod. Sikkim Himal. t. 1 & 2 (1849)-Fl. Brit. Ind. **3**: 469 (1882), p.p.-Sp. Rhod. 492, fig. (1930)-Spring Fl. Sikkim Himal. f. 65 (1963).

Palmajua-Rimbick, 2200–1500 m (May 5, 1960, no. 117, fl.); Rimbick, 2200 m (May 6, 1960, fl.); Damthang-Temi, 2000 m (Mar. 25, 1963, fr.); Taplejung-Garhi Danra, 1900–2200 m (Nov. 3, 1963, fr.); Iladanda-Helok, 1800–1500 m (Nov. 13, 1963, fr.); Tharpu-Chyangthaphu, 1200–1300 m (Nov. 26, 1963).

Distr. E. Himalaya (Nepal to NEFA).

Rhododendron elaeagnoides Hooker f., Rhod. Sikkim Himal. t. 23 B (1851)-Sp. Rhod. 439 (1930).

Bakkim-Jongri, 3900–4000 m (May 19, 1960, no. 353, fr.); Jongri, 4100 m (May 22, 1960, fr.); Jongri-Gamothang, 4200–3600 m (May 26, 1960, no. 500, fr.); Phalut-

Sandakphu, 3500 m (Jun. 6, 1960, no. 680, fr.).

Distr. E. Himalaya (E. Nepal to Bhutan), S. Tibet, N. Burma, and W. China (Yunnan).

Rhododendron Falconeri Hooker f., Rhod. Sikkim Himal. t. 10 (1849)–Fl. Brit. Ind. **3**: 465 (1882)–Sp. Rhod. 244, fig. (1930).

Phalut-Chia Bhanjang, 3500–3100 m (May 11, 1960, fl.); Bakkim–Jongri, 2500–4000 m (May 19, 1960, fl.); Thakma Khola, 3200 m (Nov. 12 & 16, 1963); Diorali Bhanjang, 3400 m (Nov. 14, 1963); Siling Tzokupa, 3000 m (Nov. 21, 1963, fr.).

Distr. E. Himalaya (Nepal to NEFA).

Rhododendron fulgens Hooker f., Rhod. Sikkim Himal. t. 25 (1851)–Fl. Brit. Ind. **3**: 466 (1882)–Sp. Rhod. 178 (1930).

Bakkim–Jongri, 3900 m (May 19, 1960, fl.); Migothang, 3900 m (May 31, 1960, fl.).

Distr. E. Himalaya (Nepal to Bhutan), and S. Tibet.

Rhododendron grande Wight in Calcut. Journ. Nat. Hist. **8**: 176 (1847); Icon. **4**: t. 1202 (1850)–Fl. Brit. Ind. **3**: 464 (1882)–Sp. Rhod. 310 (1930).

R. argenteum Hook. f., Rhod. Sikkim Himal. t. 9 (1849).

Ramam, 2400–2800 m (May 8, 1960, fr.); Gamothang, 3800 m (May 29, 1960, fr.); Minchin Dhap–Mul Pokhari, 2900–2500 m (Oct. 29, 1963, fr.); Baroya Khimty–Thakma Khola, 2500–3200 m (Nov. 16, 1963); Birwa–Yektin, 2900–1600 m (Nov. 28, 1963); Bhuspte Danra, 2800 m (Dec. 2, 1963, fr.); Tendong Peak, 2850 m (Mar. 26, 1963, fl.).

Distr. E. Himalaya (Nepal to NEFA), and S. Tibet.

The plants from Tendong Peak have very wavy leaves, and eglandular tomentose pedicels and ovaries, and may represent a distinct variety.

Rhododendron Griffithianum Wight, Icon. **4**: t. 1203 (1850)–Fl. Brit. Ind. **3**: 468 (1882)–Sp. Rhod. 278 (1930).

R. Aucklandii Hook. f., Rhod. Sikkim Himal. t. 11 (1851).

Batasi–Palmajua, 2100–2300 m (May 3, 1960, no. 40 & 60, fl.); Ramam, 2400–2800 m (May 8, 1960, fl.); Minchin Dhap–Mul Pokhari, 2900–2500 m (Oct. 29, 1963, fr.).

Distr. E. Himalaya (Nepal to NEFA), and S. Tibet.

Rhododendron Hodgsoni Hooker f., Rhod. Sikkim Himal. t. 15 (1851)–Fl. Brit. Ind. **3**: 464 (1882)–Sp. Rhod. 247 (1930)–Spring Fl. Sikkim Himal. f. 60 & 61 (1963).

Sandakphu–Phalut, 3300–3600 m (May 8, 1960, fl.); Phalut-Chia Bhanjang, 3600–3100 m (May 11 & Jun. 3, 1960, fl.); Bakkim–Jongri, 3000–3800 m (May 19, 1960, no. 359); Migothang–Nayathang, 3900–3300 m (Jun. 1, 1960, no. 717, fl.); Walunchung Gola-Zongi, 3800–2800 m (Nov. 11, 1963, fr.); Thakma Khola–Diorali Bhanjang, 3200–3500 m (Nov. 14, 1963, fr.); Siling Tzokupa, 2800 m (Nov. 21, 1963, fr.).

Distr. E. Himalaya (Nepal to Bhutan), and S. Tibet.

Rhododendron lanatum Hooker f., Rhod. Sikkim Himal. t. 16 (1851)–Fl. Brit. Ind. **3**: 467 (1882)–Sp. Rhod. 179 (1930)–Spring Fl. Sikkim Himal. f. 49 (1963).

Bakkim–Jongri, 3800–4000 m (May 19, 1960, no. 361, fl.); Jongri, 4000 m (May 23, 1960); Migothang–Nayathang, 3900–3300 m (Jun. 1, 1960, fl.).

Distr. E. Himalaya (Sikkim, Bhutan), and S. Tibet.

Rhododendron lepidotum Wallich [Cat. no. 758 (1829), nom. nud.] ex G. Don, Gen. Hist. **3**: 845 (1834)–Fl. Brit. Ind. **3**: 471 (1882)–Sp. Rhod. 442, fig. (1930)–Spring Fl. Sikkim Himal. f. 82 (1963).

R. salignum Hook. f., Rhod. Sikkim Himal. t. 23 A (1851).

Sandakphu–Garibans, 3400–2800 m (Jun. 7, 1960, no. 686, fl.); Tinjuray, 2900 m (Oct. 27, 1963, fr.); Hati Sar–Minchin Dhap, 2700–2900 m (Oct. 28, 1963, fr.); Minchin Dhap–Mul Pokhari, 2900–2500 m (Oct. 29, 1963, fr.); Zongi–Walunchung Gola, 2800–3800 m (Nov. 10 & 11, 1963, fl., fr.); Siling Tzokupa, 2800 m (Nov. 21, 1963, fr.).

Distr. Himalaya (Kashmir to Bhutan), and S. Tibet.

The flowers are rosy or pale greenish yellow.

Rhododendron Lindleyi T. Moore in Gard. Chron. **1864**: 364 (1864)–Hutchinson in Not. Bot. Gard. Edinb. **12**: 38, f. 6 (1919)–Sp. Rhod. 494 (1930)–Bot. Mag. n.s. t. 363 (1960)–Spring Fl. Sikkim Himal. f. 64 (1963).

R. bhotanicum C. B. Clarke in Fl. Brit. Ind. **3**: 475 (1882).

Senchal, 2400 m (Apr. 6, 1960, fl.); Bilbatay Bhanjang–Hati Sar, 2200–2900 m (Oct. 27, 1963, fr.); Minchin Dhap–Mul Pokhari, 2900–2500 m (Oct. 29, 1963, fr.); Baroya Khimty, 2500 m (Nov. 11, 1963); Birwa–Yektin, 2900–1600 m (Nov. 28, 1963, fr.); Bhuspate Danra–Mai Majuwa, 2900–1600 m (Dec. 3, 1963).

Distr. E. Himalaya (Nepal to Bhutan), Manipur, S. Tibet, and Burma.

Rhododendron pendulum Hooker f., Rhod. Sikkim Himal. t. 13 (1849)–Fl. Brit. Ind. **3**: 469 (1882)–Sp. Rhod. 232 (1930).

Bakkim–Jongri, 2500–3700 m (May 19, 1960, no. 383, fl.); Baroya Khimty–Thakma Khola, 2500–3200 m (Nov. 16, 1963, fr.).

Distr. E. Himalaya (Nepal to Bhutan), and S. Tibet.

Rhododendron setosum D. Don in Mem. Wern. Nat. Hist. Soc. **3**: 408 (1821)–Hook. f., Rhod. Sikkim Himal. t. 20 (1851)–Fl. Brit. Ind. **3**: 472 (1882)–Sp. Rhod. 428, fig. (1930)–Spring Fl. Sikkim Himal. f. 40 (1963).

Jongri, 4000–4200 m (May 21–23, 1960, no. 446 & 462, fl.); Jongri–Gamothang, 4200–3600 m (May 26, 1960, no. 562, fl.).

Distr. E. Himalaya (Nepal to Bhutan), and S. Tibet.

Rhododendron Thomsonii Hooker f., Rhod. Sikkim Himal. t. 12 (1851)–Fl. Brit. Ind. **3**: 468 (1882)–Sp. Rhod. 745, fig. (1930)–Spring Fl. Sikkim Himal. f. 58 (1963).

Bakkim–Jongri, 3000–3600 m (May 19, 1960, no. 360, fl.); Hati Sar–Minchin Dhap, 2700–2900 m (Oct. 28, 1963).

Distr. E. Himalaya (Nepal to Bhutan), and S. Tibet.

Rhododendron triflorum Hooker f., Rhod. Sikkim Himal. t. 19 (1851)–Fl. Brit. Ind. **3**: 474 (1882)–Sp. Rhod. 791, fig. (1930).

Hati Sar–Minchin Dhap, 2700–2900 m (Oct. 28, 1963, fr.); Minchin Dhap–Mul Pokhari, 2800 m (Oct. 29, 1963, fr.); Birwa–Yektin, 2900–2400 m (Nov. 28, 1963, fr.).

Distr. E. Himalaya (E. Nepal to Bhutan), and S. Tibet.

Rhododendron vaccinioides Hooker f., Rhod. Sikkim Himal. consp. 3 (1851)–Fl. Brit. Ind. **3**: 464 (1882)–Sp. Rhod. 825, fig. (1930)–Bot. Mag. t. 9407 B (1935).

Rimbick, 2200 m (May 6, 1960, fr.); Dentam–Pamianchi, 1500–2000 m (May 12, 1960, fr.); Ghum–Lopchu, 2300–1500 m (Jun. 19, 1960, fl.); Jalapahar, 2300 m (Jun. 21, 1960, fl.); Dhamthang–Temi, 2000 m (Mar. 25, 1963); Minchin Dhap–Mul Pokhari, 2900–2500 m (Oct. 29, 1963, fr.); Baroya Khimty, 2500 m (Nov. 11, 1963, fr.); Bhandukay Bhanjang–Mai Majuwa, 2900–1800 m (Dec. 3, 1963).

Distr. E. Himalaya (Nepal, Sikkim), S. Tibet, and N. Burma.

Rhododendron Wightii Hooker f., Rhod. Sikkim Himal. t. 27 (1851)–Fl. Brit. Ind. **3**: 467 (1882)–Sp. Rhod. 386 (1930)–Spring Fl. Sikkim Himal. f. 59 (1963).

Bakkim–Jongri, 3000–4000 m (May 19, 1960, no. 355, fl.); Jongri–Olothang, 4000 m (May 23, 1960, no. 468, fl.); Migothang, 3900 m (May 31, 1960, no. 590, fl.).

Distr. E. Himalaya (Nepal to Bhutan).

Vaccinium Dunalianum Wight in Calcut. Journ. Nat. Hist. **8**: (1847), ut *Dunallianum*; Icon. **4**: 5, t. 1194 (1848)–Fl. Brit. Ind. **3**: 453 (1882)–Sleumer in Engl., Bot. Jahrb. **71**: 448 (1941).

Thibaudia revoluta Griffith, Icon. Pl. Asia. **4**: t. 513 (1854).

Chia Bhanjang–Dentam, 3100–1400 m (May 11, 1960, no. 203, fl.); Dentam–Pamianchi, 1500–2000 m (May 12, 1960, no. 237, fl.); Helok–Selap, 1500–2600 m (Nov. 8 & 9, 1963, fr. black); Baroya Khimty–Thakma Khola, 2500–3200 m (Nov. 16, 1963, fr.); Tharpu–Chyangthaphu (Nov. 26, 1963, fr.); Tharpu–Khunga, 1200–2300 m (Nov. 27, 1963, fr.); Chyangthaphu–Birwa, 1300–2400 m (Nov. 27, 1963, fr.); Bhandukay Bhanjang, 3000 m (Dec. 3, 1963, fr.).

Distr. E. Himalaya (E. Nepal to NEFA), Khasia, Manipur, N. Burma, Indo-China, and W. China.

Vaccinium gaultheriifolium (Griff.) Hooker f. ex C. B. Clarke in Fl. Brit. Ind. **3**: 453 (1882), ut *gaultheriaefolium*–Sleumer, l.c. 445 (1941).

Thibaudia gaultherifolia Griffith, Icon. Pl. Asia. **4**: t. 512 (1854).

Helok–Iladanda, 1500–1800 m (Nov. 8 & 13, 1963, fr.).

Distr. E. Himalaya (E. Nepal to NEFA), N. Burma, and Yunnan.

Vaccinium glauco-album Hooker f. ex C. B. Clarke in Fl. Brit. Ind. **3**: 453 (1882)–Bot. Mag. t. 9536 (1938)–Sleumer, l.c. 444 (1941).

Baroya Khimty–Thakma Khola, 2500–3200 m (Nov. 16, 1963, fr.).

Distr. E. Himalaya (E. Nepal to NEFA), S. Tibet, and N. Burma.

Vaccinium Nummularia Hooker f. et Thomson ex C. B. Clarke in Fl. Brit. Ind. **3**: 451 (1882)–Sleumer, l.c. 431 (1941).

Phalut–Chia Bhanjang, 3600–3100 m (May 11 & Jun. 2, 1960, no. 205, fl.); Bakkim–Jongri, 2500–4000 m (May 19, 1960, fl.); Garibans–Tonglu, 2800–3000 m (Jun. 2, 1960, fl.); Hati Sar–Minchin Dhap, 2700–2900 m (Oct. 28, 1963); Minchin Dhap–Mul Pokhari, 2900–2500 m (Oct. 29, 1963, fr.); Walunchung Gola–Zongi, 3800–2800 m (Nov. 11, 1963); Diorali Bhanjang, 3300–3500 m (Nov. 14 & 17, 1963); Siling Tzokupa, 2900–3100 m (Nov. 21, 1963, bud); Bhuspate Danra, 2900 m (Dec. 2, 1963).

Distr. Himalaya (Nepal to NEFA), Naga Hills, and N. Burma.

Vaccinium retusum (Griff.) Hooker f. ex C. B. Clarke in Fl. Brit. Ind. **3**: 451 (1882)–Sleumer, l.c. 434 (1941).

Thibaudia retusa Griffith, Not. **4**: 300 (1854); Icon. Pl. Asia. **4**: t. 509 (1854).

Ghum, 2300 m (Apr. 4, 1960, fl.); Batasi–Palmajua, 2300–2600 m (May 3, 1960, fl.); Rimbick–Ramam, 1900–2400 m (May 7, 1960, fl.); Bakkim–Jongri, 2500–4000 m (May 19, 1960, no. 368, fl.); Garibans–Tonglu, 2800–3000 m (Jun. 7, 1960, fl.); Senchal–Tiger Hill, 2400–2500 m (Jun. 23, 1960); above Tutay, 2700 m (Oct. 26, 1963, bud); Hati Sar–Michin Dhap, 2700–2900 m (Oct. 28, 1963, fr. black)); Baroya Khimty, 2500 m (Nov. 11, 1963, bud); Thakma Khola, 3200 m (Nov. 16, 1963, fr.); Birwa-Yektin, 2900–1600 m (Nov. 28, 1963); Bhuspate Danra-Bhandukay Bhanjang, 2800-3100 m (Dec. 3, 1963); Lagyap, Gangtok, 2200 m (Sep. 13, 1964, fr.).

Distr. E. Himalaya (Nepal to NEFA), Naga Hills, and Manipur.

Vaccinium vacciniaceum (Roxb.) Sleumer, l.c. 479 (1941).

Ceratostemma vacciniacea Roxburgh, Fl. Ind. ed. 2, **2**: 412 (1832).

Agapetes serrata G. Don, Gen. Hist. **3**: 862 (1834).

Vaccinium serratum (G. Don) Wight, Icon. **4**: t. 1184 (1848)–Fl. Brit. Ind. **3**: 452 (1882).

Darjeeling, 2100 m (Apr. 3 & 7, 1960, fl.); Palmajua-Rimbick (May 5, 1960, no. 116, defl.); Phalut-Dentam (May 11, 1960, defl.); Garibans-Tonglu, 2800-3000 m (Jun. 7, 1960, defl.); Gangtok, 1600 m (Jun. 14, 1960, defl.); Iladanda-Helok (Nov. 13, 1960, bud); Garhi Danra-Tuwa, 2200-1800 m (Nov. 4, 1963); Rabong La-Kyosing, 2000 m (Mar. 28, 1963, bud).

f. **hispidum** (C. B. Clarke) Hara, comb. nov.

V. venosum Wight var. *hispida* C. B. Clarke in Fl. Brit. Ind. **3**: 452 (1882).

V. vacciniaceum var. *hispidum* (Clarke) Sleumer, l.c. 479 (1941).

Chyangthaphu-Birwa, 1600-2000 m (Nov. 27, 1963, bud); Taplejung-Garhi Danra, 1900-2200 m (Nov. 3, 1963).

Distr. sp. E. Himalaya (E. Nepal to Bhutan), Khasia, Naga Hills, Manipur, and N. Burma.

MYRSINACEAE (by Hiroshi Hara)

Ardisia macrocarpa Wallich in Roxburgh, Fl. Ind. ed. Carey, **2**: 277 (1824)–Fl. Brit. Ind. **3**: 524 (1882)–Mez in Pfl.-reich IV-236, Ht. **9**: 145 (1902).

Takdah, 1600 m, cult. (Apr. 19, 1960, fr.); Dentam–Pamianchi, 1500–2000 m (May 12, 1960, fr.); Rabong La–Temi, 1200 m (May 28, 1963, fr.); Gokarna, Kathmandu, 1500 m (Sep. 22, 1963, fr.); Ghatte–Khebang, 1600–2400 m (Nov. 19, 1963, fr.); Khebang–Siling Tzokupa, 1700–2100 m (Nov. 20, 1963, fr.).

Distr. E. Himalaya (Nepal to NEFA), and Khasia.

The fruits are 7–9 mm in diameter when dry, and are larger than those of an allied species, *A. crenata* Sims of China and Japan.

Ardisia solanacea Roxburgh, Pl. Corom. **1**: 27, t. 27 (1795)–Mez, l.c. 132, f. 20 F-K (1902)–Walker in Philip. Journ. Sci. **73**: 58 (1940).

A. humilis Vahl sensu Fl. Brit. Ind. **3**: 529 (1882), p.p.

Peshok, 700 m (Apr. 27, 1960, fl.); Tista, 300 m (Jun. 20, 1960, fl.); Illam–Ranga Pani (Dec. 8, 1963, fr.); Ranga Pani–Ghorwa, 700–300 m (Dec. 9, 1963, fr.).

Distr. Tropical Himalaya, south to Ceylon, Malaya, and W. China (Yunnan).

Embelia Ribes Burman f., Fl. Ind. 62, t. 23 (1768)–Fl. Brit. Ind. **3**: 513 (1882)–Mez, l.c. 303 (1902)–Walker, l.c. 159 (1940).

Gangtok, 1500 m (Mar. 18, 1963, fl.); Rabong La–Temi, 1200 m (Mar. 28, 1963).

Distr. Himalaya, south to Ceylon, Indo-China, Malaysia, and S. China.

Maesa argentea (Wall.) A. DC. in Ann. Sci. Nat. ser. 2, **16**: 96, t. 5 B (1841)–Fl. Brit. Ind. **3**: 510 (1882)–Mez, l.c. 39 (1902)–Walker, l.c. 14, f. 1 (1940).

Baeobotrys argentea Wall. ex Roxb., Fl. Ind. ed. Carey, **2**: 233 (1824).

Hilay–Murhay, 1700–2100 m (Oct. 23, 1963, fr.); Yektin–Akasay, 1700 m (Nov. 30, 1963, fr.).

Distr. Himalaya (Garhwal to Nepal), and W. China.

Maesa Chisia Hamilton ex D. Don. Prodr. Fl. Nepal. 148 (1825)–Fl. Brit. Ind. **3**: 509 (1882)–Mez, l.c. 40, f. 4 (1902).

Kurseong, 1550 m (Apr. 11, 1960, no. 780, fr. juv.); Senchal–Takdah, 1700 m (Apr. 17, 1960, no. 1942, fl.); Takdah, 1700 m (Apr. 19, 1960, no. 2122, defl.); Palmajua–Rimbick, 2200–2300 m (May 5, 1960, defl.); Dentam, 1500 m (May 12, 1960, fr. juv.); Gangtok, 1500 m (Mar. 18, 1963, fl.); Penlong La, 2100 m (Mar. 18, 1963, fl. & fr.); Kakani, 2100 m (Sep. 24, 1963, fr.); Sanguri Bhanjang, 1200 m (Oct. 16, 1963, fr.); Mul Pokhari–Dumhan, 1300 m (Oct. 30, 1963, fr.); Taplejung–Garhi Danra, 1900–2000 m (Nov. 3, 1963, fr.); below Siling Tzokupa (Nov. 21, 1963); Khebang–Bharomdin, 1700–1000 m (Nov. 24, 1963, fr.).

Distr. E. Himalaya (Nepal to Bhutan), Khasia, Manipur, and N. Burma.

Maesa macrophylla (Wallich) A. DC. in Trans. Linn. Soc. **17**: 134 (1834)–Fl. Brit. Ind. **3**: 510 (1882)–Mez, l.c. 33 (1902).

Baeobotrys macrophylla Wallich in Roxb., Fl. Ind. ed. Carey, **2**: 234 (1824).

Maesa tomentosa D. Don, Prodr. Fl. Nepal. 148 (1825).

Kalimpong, 1700 m (Jun. 20, 1960, fr.); Takdah–Rayang, 1600–1000 m (Apr. 20, 1960, no. 2195, fl.); Sanguri Bhanjang, 1100 m (Oct. 16, 1963, fr.); below Yektin, 1100 m (Nov. 29, 1963, fr.).

Distr. E. Himalaya (Nepal to Bhutan).

Maesa montana A. DC., Prodr. **8**: 79 (1844)–Mez, l.c. 28 (1902)–Walker, l.c. 28 (1940).

M. indica Wall. sensu Fl. Brit. Ind. **3**: 509 (1882), p.p.

M. elongata (A. DC.) Mez, l.c. 31 (1902).

Tista, 400–500 m (Apr. 26, 1960, fr. juv.; Mar. 17, 1963, fl.); Ranga Pani–Ghorwa, 700–300 m (Dec. 9, 1963, fr.).

Distr. Tropical Himalaya (Nepal, Sikkim), Khasia, Manipur, N. Burma, Thai, Indo-China, and W. China.

Maesa rugosa C. B. Clarke in Fl. Brit. Ind. **3**: 508 (1882)–Mez, l.c. 45 (1902) –Spring Fl. Sikkim Himal. f. 151 (1963).

Tingling Bridge–Yoksam, 1000–1700 m (May 16, 1960, no. 292, fr.); Yoksam, 1700 m (May 17, 1960, no. 295, fr.); Rabong La, 2200 m (Mar. 28, 1963, fl.).

Distr. E. Himalaya (Sikkim to Bhutan), S. Tibet, Manipur, and W. China (Yunnan).

Myrsine capitellata Wallich in Roxburgh, Fl. Ind. ed. Carey, **2**: 295 (1824)–Wallich, Tent. Fl. Napal. 35, t. 25 (1826)–Fl. Brit. Ind. **3**: 512 (1882).

Rapanaea capitellata (Wall.) Mez, l.c. 356 (1902).

Tuwa–Taplethok, 1800–1400 m (Nov. 5, 1963, fl.); Taplethok–Helok, 1400–1500 m (Nov. 6, 1963, fl.); Iladanda–Selap, 1800–2600 m (Nov. 9, 1963, fl.); Khebang–Siling Tzokupa, 1700–2100 m (Nov. 20, 1963, fl.); Birwa–Yektin (Nov. 28, 1963, fl.); below Yektin, 1400 m (Nov. 29, 1963).

Distr. E. Himalaya (Nepal to Bhutan), Khasia, Burma, and Indo-China.

Myrsine semiserrata Wallich in Roxburgh, Fl. Ind. ed. Carey, **2**: 293 (1824)–Wallich, Tent. Fl. Napal. 34, t. 24 (1826)–Fl. Brit. Ind. **3**: 511 (1882)–Mez, l.c. 339 (1902)–Rehder in Pl. Wilson **2**: 580 (1916)–Walker in Philip. Journ. Sci. **73**: 190 (1940).

M. sessilis et *subspinosa* D. Don, Prodr. Fl. Nepal. 146 & 147 (1825).

M. semiserrata var. *subspinosa* (Don) C. B. Clarke in Fl. Brit. Ind. **3**: 512 (1882).

Rimbick–Ramam, 1900–2400 m (May 7, 1960, no. 126, fr.); Chia Bhanjang–Dentam, 3100–1400 m (May 11, 1960, fl., fr.); Yoksam–Bakkim, 1700–2200 m (May 18, 1960, no. 344, fl.); Darjeeling, 2150 m (Mar. 13, 1963, fl.); Damthang–Temi, 2200–1800 m (Mar. 25, 1963, fl.); Damthang–Tendong, 2300 m (Mar. 26, 1963, fr.); Pouwa, Kathmandu, 1600 m (Oct. 6, 1963, fr.); Kakani, 2100 m (Sep. 24, 1963, fr.); Iladanda–Selap (Nov. 9, 1963, fr.); Bankuday–Yamphodin, 2400–2100 m (Nov. 16, 1963); Birwa–Yektin, 1600–2900 m (Nov. 28, 1963).

Distr. Himalaya (Garhwal to NEFA), Khasia, Manipur, S. E. Tibet, N. Burma, and W. & C. China (east to Hupeh).

The flowers are greenish, and the fruits are purple-red, then turn to blue.

PRIMULACEAE (by Hiroshi Hara)

Anagallis pumila Swartz, Prodr. Veg. Ind. Occ. **1**: 40 (1788)–Knuth in Pfl.-reich IV–237, Ht. **22**: 331, f. 71 (1905), var. *longepedunculata* Chodat et Hassler–P. Taylor in Kew Bull. **1955**: 342 (1955), var. *pumila*.

Centunculus tenellus Duby in DC., Prodr. **8**: 72 (1844)–Fl. Brit. Ind. **3**: 506 (1882).

Micropyxis pumila (Sw.) Duby, l.c. 72 (1844).

Micropyxis tenella (Duby) Wight, Icon. t. 1585 (1850).

Sunderijal, Kathmandu, 1600 m (Sep. 20, 1963, fr.); Bharomdin–Tharpu, 800–1000 m (Nov. 25, 1963, fr.).

Distr. Himalaya, India, Timor, Australia, Tropical Americas, and Africa.

Androsace Croftii Watt in Journ. Linn. Soc. **20**: 17, t. 14 B (1882)–Knuth, l.c. 174 (1905).

Migothang, 3900 m (May 31, 1960, no. 602, fl.); Migothang–Nayathang, 3900–3500 m (Jun. 1, 1960, fl.).

Distr. E. Himalaya (the Singalila Range).

In our specimens, the rhizomes are thick and not stoloniferous, the leaves deeply 5–7-lobed to or beyond the middle, the pedicels very short 0.5–3.5 mm long, and the corollae about 6 mm in diameter and dark purplish red. *A. dissecta* Franchet of Yunnan and Szechuan seems to be closely allied to our plants.

Androsace Lehmanni Wallich ex Duby in DC., Prodr. **8**: 48 (1844)–Fl. Brit. Ind. **3**: 500 (1882)–Knuth, l.c. 202, f. 47 C (1905)–Spring Fl. Sikkim Himal. f. 2 (1963).

Near Jongri, 4300 m (May 22, 24 & 25, 1960); East Rathang Glacier, 4300 m (May 20, 1960, Sah); Gamothang–Migothang, 3900–4400 m (May 30, 1960).

Distr. E. Himalaya (Nepal, Sikkim).

Androsace sarmentosa Wallich in Roxb., Fl. Ind. ed. Carey, **2**: 14 (1824)–Wallich, Pl. Asia. Rar. **3**: t. 206 (1832)–Fl. Brit. Ind. **3**: 498 (1882), var. *Watkinsi* Hook. f.–Knuth, l.c. 183, excl. var. (1905), p.p.–Hand.-Mzt. in Not. Bot. Gard. Edinb. **15**: 278 (1927)–Spring Fl. Sikkim Himal. f. 83 (1963).

Below Tonglu, 2900 m (Jun. 8, 1960, fl.).

Distr. Himalaya (Garhwal to Sikkim).

Androsace Selago Hooker f. et Thomson ex Klatt in Linnaea **32**: 292 (1863)–Watt in Journ. Linn. Soc. **20**: 18, t. 18 A (1882)–Fl. Brit. Ind. **3**: 500 (1882)–

Knuth, l.c. 202, f. 47 D (1905).

Gamothang–Migothang, 3900–4400 m (May 30, 1960); Sandakphu–Tonglu, 3000–3500 m (Jun. 7, 1960).

Distr. E. Himalaya (Nepal, Sikkim), and S. Tibet.

Bryocarpum himalaicum Hooker f. et Thomson in Hook., Journ. Bot. **9**: 200, t. 5 (1857)–Fl. Brit. Ind. **3**: 501 (1882)–Knuth, l.c. 232, f. 53 (1905).

Nayathang–Chia Bhanjang, 3300 m (Jun. 2, 1960, no. 743 & 773, fl.).

Distr. E. Himalaya (Sikkim, Bhutan), and S. Tibet.

Lysimachia alternifolia Wallich in Roxb., Fl. Ind. ed. Carey, **2**: 26 (1824)–Fl. Brit. Ind. **3**: 504 (1882)–Knuth, l.c. 272 (1905)–Hand.-Mzt. in Not. Bot. Gard. Edinb. **16**: 106 (1928)–Weibel in Candollea **15**: 158 (1956).

Tingling Bridge–Yoksam, 1000–700 m (May 16, 1960, no. 309 & fl., fr.); Dentam–Pamianchi, 1500–2000 m (May 12, 1960, fl.); Chia Bhanjang–Dentam (May 11, 1960, fl., fr.); Pamianchi–Tingling Bridge, 1000–2000 m (May 15, 1960, fl.); Gangtok, 1650 m (Jun. 13, 1960, fl., fr.); Kakani, 2100 m (Sep. 24, 1963, fr.); Dhankuta, 1200 m (Oct. 19, 1963, fr.); Sinduwa, 2100 m (Oct. 23, 1963, fr.); Tuwa–Taplethok, 1800–1300 m (Nov. 5, 1963, fr.); Taplejung–Garhi Danra, 1900–2200 m (Nov. 3, 1963, fr.); Helok, 1500 m (Nov. 7, 1963, fr.); Iladanda–Helok, 1800–1500 m (Nov. 13, 1963, fr.); Bharomdin–Tharpu, 700–1200 m (Nov. 25, 1963, fr.); Birwa–Yektin, 2400–1700 m (Nov. 28, 1963, fr.); Yektin–Batasay, 1400–2400 m (Nov. 30, 1963, fr.); Dhara Pani–Illam, 1500–1200 m (Dec. 5, 1963, fr.).

Distr. Himalaya (Garhwal to Bhutan), and Khasia.

Lysimachia congestiflora Hemsley in Journ. Linn. Soc. **26**: 50 (1889)–Knuth, l.c. 283 (1905)–Hand.-Mzt., l.c. 93 (1928)–Migo in Journ. Shangh. Sci. Inst. **14**: 69 (1944).

L. japonica Thunb. sensu Fl. Brit. Ind. **3**: 505 (1882), p.p.

L. japonica var. *cephalantha* Franchet in Journ. de Bot. **9**: 461 (1895).

L. cephalantha (Fr.) Knuth, l.c. 284 (1905), p.p.

Gangtok, 1650 m (Jun. 15, 1960, fl.); Tingling Bridge–Yoksam, 1000–1700 m (May 16, 1960, fl.); Penlong La, 2100 m (Mar. 18, 1963; cult. in Tokyo, Aug. 1963 & Jun. 1964, fl.); Tendong Peak, 2700 m (Mar. 26, 1963, fr.).

Distr. E. Himalaya (Sikkim, Bhutan), Assam, N. Thai, E. Tibet, China (except north), and Formosa.

Lysimachia debilis Wallich in Roxb., Fl. Ind. ed. Carey, **2**: 25 (1824), e typo–Hand.-Mzt., l.c. 92 (1928).

L. japonica Thunb. sensu Fl. Brit. Ind. **3**: 505 (1882), p.p.

Kurseong, 1550 m (Apr. 12, 1960, fr.); Darjeeling, 2150 m (Jun. 26, 1960, fl.); Bilbatay Bhanjang, 2200 m (Oct. 25, 1963, fr.); Minchin Dhap–Mul Pokhari, 2900–2500 m (Oct. 29, 1963, fr.); Baroya Khimty, 2500 m (Nov. 11, 1963; cult. in Tokyo, Jun. 8, 1964, fl.); Birwa–Yektin, 2400–1700 m (Nov. 28, 1963, fr.).

Distr. Himalaya (Punjab to Sikkim), Khasia, and Thai?

The relations between this species, *L. ferruginea*, and *L. japonica* Thunb. are discussed on page 648.

Lysimachia evalvis Wallich in Roxb., Fl. Ind. ed. Carey, **2**: 27 (1824)–Fl. Brit. Ind. **3**: 504 (1882)–Knuth, l.c. 268, f. 57, D-E (1905), excl. *β. sessiliflora.*

Yoksam–Bakkim, 1700–2200 m (May 18, 1960, fl.); Dentam–Pamianchi, 1500–2000 m (May 12, 1960, no. 227, fl.); Gangtok, 1650 m (Jun. 15, 1960, fl.); Birch Hill, Darjeeling, 2000 m (Jun. 18, 1960, fl. & fr.).

Distr. E. Himalaya (Nepal, Sikkim), and Khasia.

Lysimachia ferruginea Edgeworth in Trans. Linn. Soc. **20**: 83 (1851), e typo–Hand.-Mzt., l.c. 92 (1928).

L. japonica Thunb. sensu Fl. Brit. Ind. **3**: 505 (1882), p.p.

Pouwa near Kathmandu, 1600 m (Oct. 9, 1963, fr.); Baroya Khimty, 2600 m (Nov. 10, 1963, fl. & fr.).

Distr. Himalaya (Simla to Sikkim), Khasia, Naga Hills, and N. Burma.

At Pouwa, some individuals have leaves with dark purple patch along veins.

Lysimachia prolifera Klatt in Abh. Nat. Ver. Hamb. **4**: (4): 30, t. 16 (1866)–Fl. Brit. Ind. **3**: 503 (1882)–Knuth, l.c. 275 (1905)–Hand.-Mzt., l.c. 118 (1928)–Weibel, l.c. 159 (1956).

Migothang–Nayathang, 3900–3300 m (Jun. 1, 1960, no. 711, fl.); Senchal, 2400 m (Apr. 16, 1960, fl.); Chia Bhanjang–Phalut, 3100–3500 m (Jun. 2, 1960, fl.); Batasi–Palmajua, 2100–2300 m (May 3, 1960, no. 43, fl.).

Distr. Himalaya (Garhwal to Sikkim), E. Tibet, and Yunnan.

Lysimachia ramosa Wallich ex Duby in DC., Prodr. **8**: 65 (1844)–Fl. Brit. Ind. **3**: 503 (1882)–Knuth, l.c. 271, f. 57, A–C (1905)–Hand.-Mzt., l.c. 75 (1928).

Rimbick–Ramam, 1900–2400 m (May 7, 1960, old fr.); Gangtok, 1650 m (Jun. 15, 1960, fl.); Birch Hill, Darjeeling, 2000 m (Jun. 18, 1960, fl., fr.); Senchal, 2350 m (Sep. 19, 1964, fr.); Batasay–Bhuspate Danra, 2400–2900 m (Dec. 1, 1963, fr.); below Mai Majuwa–Dhara Pani, 1600–1500 m (Dec. 4, 1963, fr.).

Distr. E. Himalaya (Nepal, Sikkim), Khasia, Burma, N. Thai, Tonkin, and Yunnan.

Primula Calderiana Balfour f. et Cooper in Not. Bot. Gard. Edinb. **9**: 7 (1915)–W. W. Smith et Fletcher in Trans. Roy. Soc. Edinb. **61**: 300 (1944)–Spring Fl. Sikkim Himal. f. 28 & 29 (1963).

P. obtusifolia Royle var. *Roylei* Hooker f., Fl. Brit. Ind. **3**: 489 (1882), p.p.

P. obtusifolia Royle sensu Hooker in Bot. Mag. t. 6956 (1887)–Pax in Pfl.-reich IV–237, Ht. **22**: 118 (1905), p.p.

P. Gammieana King ex Balfour f. in Not. Bot. Gard. Edinb. **9**: 168 (1916).

P. Roylei Balfour f. et W. W. Smith in Not. Bot. Gard. Edinb. **9**: 198 (1916).

Jongri–Olothang, 3600 m (May 23, 1960, no. 472, fl.); Jongri–Gamothang (May 26, 1960, no. 510, fl.); Jongri, 4000 m (May 21, 1960); Bakkim–Jongri, 4000 m (May 19, 1960, no. 357, fl.); Sandakphu, 3600 m (May 7, 1960, fl.).

f. **alba** (W. W. Smith) Hara, stat. nov.

P. Roylei var. *alba* W. W. Smith in Not. Bot. Gard. Edinb. **19**: 211 (1937).

P. Calderiana var. *alba* (W. W. Sm.) W. W. Sm. et Fletcher, l.c. 302 (1944).

Gamothang, 3700 m (May 27, 1960, fl.).

Distr. sp. E. Himalaya (Nepal to Bhutan), and S. Tibet.

We also found a population with pink flowers near Gamothang.

Primula capitata Hooker in Bot. Mag. t. 4550 (1850); t. 6916 B (1887)–Fl. Brit. Ind. **3**: 486 (1882)–Pax, l.c. 94 (1905)–W. W. Smith et Fletcher in Trans. Bot. Soc. Edinb. **34**: 150 (1944).

Gamothang, 3750 m (May 29, 1960, no. 657, fl.); north of Jongri, 4000–4500 m (May

25, 1960, no. 478, fr. annot.).

Distr. E. Himalaya (Sikkim, Bhutan) and S. Tibet.

subsp. **crispata** (Balf. f. et W. W. Sm.) W. W. Smith et Forrest in Not. Bot. Gard. Edinb. **16**: 18 (1928)–W. W. Sm. et Fletcher, l.c. 153 (1944).

P. crispata Balf. f. et W. W. Sm. in Not. Bot. Gard. Edinb. **9**: 162 & 185 (1916).

Jongri, 4000–4200 m (May 21, 1960, no. 440, fr. annot.).

Distr. E. Himalaya (Sikkim, Bhutan), Tibet, and N. Burma.

Primula denticulata Smith, Exot. Bot. **2**: 109, t. 114 (1805)–Fl. Brit. Ind. **3**: 485 (1882)–Pax, l.c. 90 (1905)–W. W. Smith et Fletcher in Trans. Roy. Soc. Edinb. **61**: 471 (1946)–Spring Fl. Sikkim Himal. f. 38 (1963).

P. aequalis Craib in Not. Bot. Gard. Edinb. **10**: 205 (1918).

Sandakphu, 3600 m (May 7, 1960, fl.); Phalut, 3550 m (May 9 & 10, 1960, fl.; Jun. 4 & 5, 1960, no. 646, fr.).

Distr. Afghanistan, Himalaya (Kashmir to Bhutan), Assam, S. Tibet, and N. Burma.

Primula deuteronana Craib in Not. Bot. Gard. Edinb. **6**: 251 (1917)–W. W. Smith et Fletcher in Trans. Roy Soc. Edinb. **61**: 276 (1944)–Spring Fl. Sikkim Himal. f. 39 (1963).

P. petiolaris var. *nana* Hook. f. in Fl. Brit. Ind. **3**: 493 (1882), p.p.–Pax, l.c. 40 (1905), p.p.

Jongri, 4000–4500 m (May 21 & 22, 1960, no. 435, fl.).

Distr. E. Himalaya (Nepal, Sikkim).

Primula Gambeliana Watt in Journ. Linn. Soc. **20**: 3, t. 1 (1882)–Fl. Brit. Ind. **3**: 483 (1882)–Pax, l.c. 122 (1905)–W. W. Smith et Fletcher in Trans. Bot. Soc. Edinb. **33**: 480 (1943)–Spring Fl. Sikkim Himal. f. 32 & 33 (1963).

On mossy cliffs, Migothang, 3900 m (May 30, 31 & Jun. 1, 1960, no. 601, fl. purple).

Distr. E. Himalaya (Nepal to Bhutan), and S. Tibet.

Primula glabra Klatt in Linnaea **37**: 500 (1872)–Fl. Brit, Ind. **3**: 487 (1882)–Pax, l.c. 92 (1905)–W. W. Smith et Fletcher in Trans. Roy. Soc. Edinb. **61**: 47 (1943)–Spring Fl. Sikkim Himal. f. 36 (1963).

Below Jongri, 3900 m (May 19, 1960, no. 358, fl.); Jongri, 4000–4200 m (May 21, 1960, no. 438, fl.); north of Jongri, 4000–4500 m (May 25, 1960, fl.); Gamothang–Migothang, 3900–4400 m (May 30, 1960, no. 581, fl.).

Distr. E. Himalaya (Nepal to Bhutan), and S. Tibet.

The flowers are pale mauve, and rarely almost white.

Primula gracilipes Craib in Not. Bot. Gard. Edinb. **6**: 252 (1917)–W. W. Smith et Fletcher in Trans. Roy. Soc. Edinb. **61**: 277 (1944).

P. petiolaris var. *nana* Hooker f. in Fl. Brit. Ind. **3**: 493 (1882), p.p.–Bot. Mag. t. 7079 B (1889)–Pax, l.c. 40 (1905), p.p.

P. Scullyi Craib, l.c. 255 (1917).

Phalut, 3500 m (May 10, 1960, no. 172, fl.; Jun. 5, 1960, defl.); Sandakphu-Phalut, 3300–3600 m (May 8, 1960, fl.); Jongri–Gamothang, 4200–3800 m (May 26, 1960, no. 519, fl.).

Distr. E. Himalaya (Nepal to Bhutan), and S. Tibet.

The species is distinguished from *P. petiolaris* Wall. by annulate corolla, but Smith & Fletcher described the corolla of *P. petiolaris* as exannulate or faintly annulate. The differences between the two species are not distinct, and it may be better to treat *P. gracilipes* as conspecific with *P. petiolaris.*

Primula ianthina Balfour f. et Cave in Not Bot. Gard. Edinb. **9**: 175 (1916)-Spring Fl. Sikkim Himal. f. 35 (1963).

Sandakphu-Kala Pokhari, 3200 m (Jun. 7, 1960, no. 685, fl.).

Dist. E. Himalaya (the Singalila Range).

Primula irregularis Craib in Not. Bot. Gard. Edinb. **6**: 253 (1917)-W. W. Smith et Fletcher in Trans. Roy. Soc. Edinb. **61**: 283 (1944).

Phalut-Chia Bhanjang, 3100-3600 m (May 11, 1960, no. 181 & 188, defl.).

Distr. E. Himalaya (Sikkim), and S. Tibet.

Primula Listeri King ex Hooker f. in Fl. Brit. Ind. **3**: 485 (1882)-Pax, l.c. 24, f. 15 (1905)-W. W. Smith et Fletcher in Trans. Roy. Soc. Edinb. **61**: 422 (1946)-Spring Fl. Sikkim Himal. f. 26 (1963).

Sandakphu-Tonglu, 3500-2800 m (Jun. 7, 1960, fl.); Bhuspate Danra, 2900 m (Dec. 1 & 2, 1963).

Distr. E. Himalaya (Nepal to Bhutan), and Manipur.

Primula obliqua W. W. Smith in Trans. Bot. Soc. Edinb. **26**: 119 (1913)-W. W. Smith et Fletcher in Trans. Roy. Soc. Edinb. **60**: 595 (1942)-Spring Fl. Sikkim Himal. f. 30 & 31 (1963).

Jongri, 4000 m (May 25, 1960, no. 487, bud); Gamothang-Migothang, 4000-3800 m (May 30, 1960, no. 578, fl.); Nayathang-Chia Bhanjang, 3300-3500 m (Jun. 2, 1960, fl.).

Distr. E. Himalaya (Nepal to Bhutan), and S. Tibet.

The flowers are milky white, generally tinged with pink, but sometimes rose-pink.

Primula petiolaris Wallich in Roxb., Fl. Ind. ed. Carey, **2**: 22 (1824); Tent. Fl. Napal. t. 31 (1826)-Fl. Brit. Ind. **3**: 493 (1882), p.p.- W. W. Smith et Fletcher in Trans. Roy. Soc. Edinb. **61**: 279 (1944).

Minchin Dhap-Mul Pokhari, 2900-2500 m (Oct. 29, 1963); Thakma Khola, 3200 m (Nov. 14 & 16, 1963, bud); Bhuspate Danra, 2800 m (Dec. 1 & 2, 1963, fl.).

Distr. E. Himalaya (Nepal, Sikkim).

Primula primulina (Sprengel) Hara in Journ. Jap. Bot. **37**: 99 (1962).

P. pusilla (non Goldie 1822 nec W. J. Hooker 1823) Wallich in Roxb., Fl. Ind. ed. Carey, **2**: 22 (1824)-Fl. Brit. Ind. **3**: 492 (1882)-Pax, l.c. 69 (1905)-W. W. Smith et Fletcher in Trans. Bot. Soc. Edinb. **33**: 264 (1942).

Androsace primuloides (non Moench 1802) D. Don, Prodr. Fl. Nepal. 81 (1825).

A. primulina Sprengel, Syst. Veg. **4** (2) (cur. post.): 57 (1827).

Jongri, 4000 m (May 23 & 25, 1960, fr.).

Distr. Himalaya (Kumaon to Bhutan), and S. Tibet.

Primula pulchra Watt in Journ. Linn. Soc. **20**: 3, t. 2A (1882)-Fl. Brit. Ind. **3**: 483 (1882)-Pax, l.c. 122 (1905)-W. W. Smith et Fletcher in Trans. Roy. Soc. Edinb. **61**: 299 (1944)-Spring Fl. Sikkim Himal. f. 34 (1963).

Migothang-Nayathang, 3800 m (Jun. 1, 1960, no. 721, fl. lavender violet).

Distr. Himalaya (Kashmir, Nepal, Sikkim).

W. W. Smith and Fletcher in 1944 placed this species in subsect. Tongolensis of sect. Petiolaris which is characterized in having exannulate corollae. The corollae of our plant, however, have a conspicuous papillose yellow annulus at the throat. At my request Dr. Fletcher kindly examined the specimens at Edinburgh, and confirmed that *P. pulchra* has actually annulate corollae.

Primula reticulata Wallich in Roxb., Fl. Ind. ed. Carey, **2**: 21 (1824)-Fl. Brit Ind. **3**: 483 (1882)-Pax, l.c. 120, f. 34 A (1905)-W. W. Smith et Fletcher in Trans. Bot. Soc. Edinb. **33**: 446 (1943).

Migothang-Nayathang, 3900-3300 m (Jun. 1, 1960, fl. pale yellow).

Distr. E. Himalaya (Nepal to Bhutan), and S. Tibet.

Primula rotundifolia Wallich in Roxb., Fl. Ind. ed. Carey, **2**: 18 (1824)-Fl. Brit. Ind. **3**: 483 (1882)-Pax. l.c. 120, f. 34 B (1905)-W. W. Smith et Fletcher in Trans. Bot. Soc. Edinb. **33**: 483 (1943)-Spring Fl. Sikkim Himal. f. 27 (1963).

P. cordifolia Pax in Engl., Bot. Jahrb. **10**: 216 (1889); l.c. 122 (1905).

P. cardiophylla Balfour f. et W. W. Smith in Not. Bot. Gard. Edinb. **9**: 152 (1916)-Bot. Mag. t. 9018 (1924).

Sandakphu, 3500 m (May 7 & Jun. 6, 1960, no. 677, fl.).

Distr. E. Himalaya (Nepal, Sikkim).

Primula scapigera (Hook. f.) Craib in Not. Bot. Gard. Edinb. **6**: 254 (1917)-W. W. Smith et Fletcher in Trans. Roy. Soc. Edinb. **61**: 284 (1944).

P. petiolaris var. *scapigera* Hook. f. in Fl. Brit. Ind. **3**: 494 (1882), p.p.-Pax, l.c. 41 (1905), p.p.

Garibans-Tonglu, 2800-3000 m (Jun. 7, 1960, fr.).

Distr. E. Himalaya (Nepal, Sikkim).

Primula Tanneri King in Journ. Asia. Soc. Beng. **55**: 227, t. 8 (1886)-Pax, l.c. 42 (1905)-W. W. Smith et Fletcher in Trans. Roy. Soc. Edinb. **61**: 306 (1944).

Mt. Singalila, 3600 m (May 11 & Jun. 2, 1960, fl. pink to white).

Distr. E. Himalaya (Nepal to Bhutan), and S. Tibet.

PLUMBAGINACEAE (by Hiroyoshi Ohashi)

Plumbago zeylanica L., Sp. Pl. ed. 1, **1**: 151 (1753)-C.B. Clarke in Fl. Brit. Ind. **3**: 480 (1882)-van Steenis in Fl. Males. **4** (2): 109 (1949).

Phusri-Dhara Pani, 450-900 m (Oct. 16, 1963, fr.); Ranga Pani-Ghorwa, 700-300 m (Dec. 9, 1963, fr.).

Distr. Tropical Africa, Australia, and Asia, but probably a native of SE. Asia.

SAPOTACEAE (by Takasi Yamazaki)

Aesandra butyracea (Roxb.) Baehni in Boissiera **11**: 29 (1965).

Bassia butyracea Roxb. in Asiat. Research. **8**: 499 (1808)-D. Don, Prodr. Fl. Nepal. 146 (1825)-Fl. Brit. Ind. **3**: 546 (1882).

Illipe butyracea (Roxb.) Engler in Bot. Jahrb. **12**: 509 (1890).

Madhuca butyracea (Roxb.) Macbride in Contr. Gray Herb. n.s. **53**: 18 (1918).

Diploknema butyracea (Roxb.) H. J. Lam in Bull. Jard. Bot. Buitenz. ser. 3, **7**: 186 (1925)-P. van Royen in Blumea **9**: 82 (1958); **10**: 111 (1960).

Dumhan-Taplejung, 700-2000 m (Nov. 1, 1963, fl.); Bharomdin-Tharpu, 1000-1200 m (Nov. 25, 1963, fl.); Khebang-Bharomdin, 1700-1000 m (Nov. 24, 1963, fl.).

Distr. E. Himalaya (Nepal, Bhutan), Tibet, Assam, and Andamans.

SYMPLOCACEAE (by Takasi Yamazaki)

Symplocos dryophila C. B. Clarke in Hooker f., Fl. Brit. Ind. **3**: 578 (1882)-Brand in Pfl.-reich IV-242, Ht. **6**: 42 (1901).

Batasi-Palmajua, 2100-2300 m (May 3, 1960, fl.).

Distr. E. Himalaya (Nepal, Sikkim).

Symplocos glomerata King [in Gamble, Darjeel. List 54 (1878), nom, nud.] ex C. B. Clarke in Fl. Brit. Ind. **3**: 577 (1882)-Brand, l.c. 69 (1901).

Penlong La, Gangtok, 2100 m (Mar. 18, 1960, fl. greenish white); Ghum, 2300 m (Apr. 4, 1960, fr.); Batasi, 2000 m (May 2, 1960, fl. & fr.); Palmajua, 2300 m (May 4, 1960, fr.); Rimbick, 2100 m (May 6, 1960, fl.); Yoksam-Bakkim, 1700-2200 m (May 18, 1960, fr.); Bakkim-Jongri, 2500-4000 m (May 19, 1960, fl.); Birwa-Yektin, 2400-1400 m (Nov. 28, 1963, fr.); Batasay-Bhuspate Danra, 2400-2900 m (Dec. 1, 1963, fr.).

Distr. E. Himalaya (Nepal to NEFA), and Khasia.

Symplocos laurina (Retz.) Wallich [Cat. no. 4416 (1830), nom. nud.] ex Rehder in Pl. Wilson. **2**: 594 (1916).

Myrtus laurinus Retzius, Obs. Bot. 26 (1786).

Eugenia laurina Willd., Sp. Pl. **2**: 967 (1799).

Symplocos spicata Roxb., Fl. Ind. ed. 2, 541 (1832)-Fl. Brit. Ind. **3**: 573 (1882)-Brand, l.c. 39 (1901).

Bhuspate Danra, 2600 m (Dec. 2, 1963, fr.).

Distr. Himalaya, India, Indo-China, Malaya, Philippines, Sumatra, Borneo, and Java.

Symplocos phyllocalyx C. B. Clarke in Hooker f., Fl. Brit. Ind. **3**: 575 (1882)-Brand, l.c. 31 (1901).

Senchal-Takdah, 2000 m (Apr. 17, 1960, fr.); Bakkim-Jongri, 2500-4000 m (May 19, 1960); Garibans-Tonglu, 2800 m (Jun. 7, 1960); Bilbatay Bhanjang-Hati Sar, 2200-2700 m (Oct. 27, 1963, fr.); Taplejung, 1700 m (Nov. 2, 1963, fl.); Baroya Khimty-Thakma Khola (Nov. 12, 1963, fr. blue); Thakma Khola, 3000 m (Nov. 13, 1963, fr.); Diorali Bhanjang-Bhandukay, 3500-2400 m (Nov. 14 & 17, 1963, young fl.); Bhuspate Danra, 2600 m (Dec. 2, 1963, young fl.).

Distr. E. Himalaya (Nepal to Bhutan).

Symplocos pyrifolia Wallich ex G. Don, Gen. Hist. **4**: 3 (1837)-A. DC., Prodr. **8**: 256 (1844)-Fl. Brit. Ind. **3**: 579 (1882)-Brand, l.c. 60 (1901).

Garhi Danra-Tuwa, 2200-1800 m (Nov. 4, 1963, fl.); above Lelep, 2600 m (Nov. 9, 1963, fl.); Yektin-Batasay, 1400-2400 m (Nov. 30, 1963, fl.).

Distr. E. Himalaya (Nepal to NEFA), and Khasia.

Symplocos ramosissima Wallich ex G. Don, Gen. Hist. **4**: 3 (1837)-A. DC., Prodr. **8**: 257 (1844)-Fl. Brit. Ind. **3**: 577 (1882)-Brand, l.c. 53 (1901).

Lodhra ramosissima (G. Don) Miers in Journ. Linn. Soc. **17**: 299 (1880).

Kurseong, 1600 m (Apr. 2, & 11, 1960); Senchal-Takdah, 2000 m (Apr. 17, 1960); Batasi, 2000 m (May 2, 1960, fr.); Palmajua-Rimbick, 2000-2300 m (May 5, 1960); Chia Bhanjang-Dentam, 1500-3100m (May 11, 1960); Pamianchi-Tingling Bridge, 1000-2000 m (May 15, 1960, fl.); Penlong La, Gangtok, 2100 m (Jun. 16, 1960, fr.); Birch Hill, 2000 m (Jun. 18, 1960, fr.); Senchal-Tiger Hill, 2400-2500 m (Jun. 23, 1960, fl.);

Baroya Khimty 2500 m (Nov. 11, 1963).

Distr. Himalaya (Kumaon to Assam).

Symplocos theaefolia D. Don, Prodr. Fl. Nepal. 145 (1825)–Fl. Brit. Ind. **3**: 575 (1882)–Brand, l.c. 66 (1901), ut *theifolia*.

Mani Bhanjang–Batasi, 2000 m (May 1, 1960, fr.); Rimbick–Ramam, 1900–2400 m (May 7, 1960, fr.); Penlong La, Gangtok, 2100 m (Jun. 16, 1960, fr.); Sinduwa, Dhankuta Distr., 2100 m (Oct. 23, 1963, fr.); Murhay, 2000 m (Oct. 23, 1963, fr.); Mul Pokhari–Dumhan, 2000 m (Oct. 30, 1963, fl.); Helok–Iladanda, 1800 m (Nov. 8, 1963, fl.); Ghatte–Khebang, 2000 m (Nov. 19, 1963, fl.); Chyangthaphu–Birwa, 2200 m (Nov. 27, 1963, fl.); Yektin–Batasay, 1900 m (Nov. 30, 1963, fl.); Lloyd Bot. Gard. (Dec. 28, 1963, fl.).

Distr. Himalaya (Kumaon to NEFA), Khasia, Burma, and Indo-China.

STYRACACEAE (by Hiroshi Hara)

Styrax Hookeri C. B. Clarke in Fl. Brit. Ind. **3**: 589 (1882)–Perkins in Pfl.-reich IV–241, Ht. **30**: 74 (1907).

Senchal, 2400 m (Apr. 17, 1960, bud); Takdah, 1700 m (Apr. 19, 1960, nos. 790 & 2141, fl.); Batasi, 2000 m (May 2, 1960, fl.); Garibans–Tonglu, 2800 m (Jun. 7, 1960); Tiger Hill, 2500 m (Jun. 23, 1960).

Distr. E. Himalaya (Nepal to Bhutan), and Manipur.

Styrax serrulatus Roxburgh, Fl. Ind. ed. 2, **2**: 415 (1832)–Fl. Brit. Ind. **3**: 588 (1882), p.p.–Perkins, l.c. 36 (1907).

Kurseong, 1550 m (Apr. 12, 1960, no. 790, fl.).

Distr. E. Himalaya (Nepal to Bhutan), N. Assam, and N. Burma.

OLEACEAE (by Hiroshi Hara)

Fraxinus floribunda Wallich in Roxb., Fl. Ind. ed. Carey, **1**: 150 (1820)–Fl. Brit. Ind. **3**: 605 (1882)–Lingelsheim in Pfl.-reich IV–243 I/II, Ht. **72**: 20, f. 5 (1920)–Rehder, Bibl. 556 (1949).

Below Siling Tzokupa–Khebang, 2100–1700 m (Nov. 22, 1963, fr.).

Distr. Himalaya (Kashmir to Bhutan), Khasia, Burma, Thai, Indo-China, and W. China.

In our specimen, the samarae are small, and 2–2.5 cm long.

Jasminum amplexicaule Hamilton ex G. Don, Gen. Hist. **4**: 60 (1837)–Kobuski in Journ. Arn. Arb. **13**: 173 (1932).

J. undulatum (non Willdenow 1797) Ker-Gawler in Bot. Reg. **6**: t. 436 (1820)–Fl. Brit. Ind. **3**: 592 (1882).

Rhenock, 1100 m (Mar. 19, 1963); Namli, 900 m (Sep. 12, 1964, fl. white).

Distr. E. Himalaya (Sikkim, Bhutan), Khasia, N. Thai, and S. China.

Jasminum dispermum Wallich in Roxb., Fl. Ind. ed. Carey, **1**: 99 (1820); Pl. Asia. Rar. **3**: t. 274 (1832)–Fl. Brit. Ind. **3**: 602 (1882)–Kobuski, l.c. 164 (1932).

Darjeeling, 1900 m (Apr. 14, 1960, fl.); Batasi–Palmajua, 2100–2300 m (May 3, 1960, no. 39, fl.); Rimbick, 2200 m (May 6, 1960, fl.); above Temi, 1800 m (Mar. 26, 1963, fl.); Teplejung, 1700 m (Nov. 2, 1963); Teplethok–Helok, 1400–1500 m (Nov. 6, 1963, fr. young); Iladanda–Helok, 1800–1500 m (Nov. 13, 1963, fr.); Ghatte–Khebang, 1600–2400 m (Nov. 19, 1963, fr.); Khunga Chuli, 2300 m (Nov. 27, 1963, fr.).

Distr. Himalaya (Kashmir to NEFA), Khasia, Manipur, N. Thai, and W. China (Yunnan).

Jasminum humile L., Sp. Pl. ed. 1, **1**: 7 (1753)–Fl. Brit. Ind. **2**: 602 (1882)–Kobuski, l.c. 150 (1932); **20**: 404 (1939)–Green in Not. Bot. Gard. Edinb. **23**: 362 (1961).

var. **revolutum** (Sims) Stokes, Bot. Comm. **1**: 18 (1830)–Kobuski, l.c. 407 (1939).

J. revolutum Sims in Bot. Mag. t. 1731 (1815).

Birwa–below Yektin, cult., 2400–1400 m (Nov. 28, 1963, fl.).

var. **pubigerum** (D. Don) Kitamura, Faun. & Fl. Nepal Himal. **1**: 204 (1955).

J. pubigerum D. Don, Prodr. Fl. Nepal 106 (1825).

Walunchung Gola–Zongi, 3800–2800 m (Nov. 11, 1963, fr.).

Distr. sp. Afghanistan, Himalaya, Tibet, Burma, and W. China.

Ligustrum confusum Decaisne in Nouv. Arch. Mus. Paris ser. 2, **2**: 24 (1879)–Fl. Brit. Ind. **3**: 616 (1882)–Mansfeld in Engl., Bot. Jahrb. **59**, Beibl. **132**: 47 (1924).

Near Garibans, 2800–2900 m (Jun. 7, 1960, bud; Sep. 17, 1964, fr.); Bilbatay Bhanjang–Hati Sar, 2200–2900 m (Oct. 27, 1963, fr.); Hati Sar–Minchin Dhap, 2700–2900 m (Oct. 28, 1963, fr.); Minchin Dhap–Mul Pokhari, 2900–2500 m (Oct. 29, 1963, fr.); Bhandukay–Yamphodin, 2500–2100 m (Nov. 16, 1963, fr.); Bhuspate Danra, 2800 m (Dec. 1 & 2, 1963, fr.).

Distr. E. Himalaya (Nepal to Bhutan), Khasia, Manipur, Burma, Thai, and Tonkin.

Ligustrum indicum (Lour.) Merrill in Trans. Amer. Philos. Soc. n. ser. **24** (2): 307 (1935)–Rehder, Bibl. 573 (1949).

Phillyrea indica Loureiro, Fl. Conchinch. **1**: 19 (1790).

Ligustrum nepalense Wallich in Roxb., Fl. Ind. ed. Carey, **1**: 151 (1820); Pl. Asia. Rar. **3**: t. 270 (1832)–Fl. Brit. Ind. **3**: 617 (1882)–Mansfeld, l.c. 61 (1924).

L. bracteolatum D. Don, Prodr. Fl. Nepal. 107 (1825).

Godavari, Kathmandu, 1500 m (Sep. 18, 1963, young fr.); Sunderijal Waterfall, 1600 m (Sep. 20, 1963, young fr.).

Distr. Himalaya (Garhwal to Sikkim), and Indo-China.

Ligustrum lucidum Aiton f., Hort. Kew. ed. 2, **1**: 19 (1810)–Mansfeld, l.c. 49 (1924)–Rehder, Bibl. 571 (1949).

Phillyrea paniculata Roxb., Fl. Ind. ed. Carey, **1**: 100 (1820).

Ligustrum nepalense β. glabrum Hooker in Bot. Mag. t. 2921 (1829)–DC., Prodr. **8**: 294 (1844).

Olea clavata G. Don, Gen. Hist. **4**: 49 (1838).

Darjeeling, cult., 2000 m (Jun. 25, 1960, bud).

Distr. China; often planted.

Nyctanthes arbor-tristis L., Sp. Pl. ed. 1, **1**: 6 (1753)–Fl. Brit. Ind. **3**: 603 (1882).

Dhara Pani–Tamur Bridge, 600 m (Oct. 17, 1963, fl. & fr.).

Distr. India; often cultivated.

Osmanthus fragrans Loureiro, Fl. Cochinch. **1**: 29 (1790)–Fl. Brit. Ind. **3**: 607 (1882)–P. S. Green in Not. Bot. Gard. Edinb. **22**: 484 (1958)–Hatusima in Journ. Jap. Bot. **36**: 350 (1961).

var. **longifolius** (DC.) Hara, comb. nov.

Notelaea Posua D. Don, Prodr. Fl. Nepal. 107 (1825).

Olea acuminata Wall. ex G. Don, Gen. Hist. **4**: 49 (1837).

Olea acuminata β. longifolia DC., Prodr. **8**: 285 (1844).

Olea fragrans var. *acuminata* (Wall.) Blume, Mus. Bot. Lugd.-Bat. **1**: 316 (1850).

Osmanthus acuminatus (Wall.) Nakai in Bot. Mag. Tokyo **44**: 14 (1930).

Lloyd Bot. Gard., Darjeeling (Dec. 28, 1963, fl. light orange-ochraceous).

Distr. Himalaya (Garhwal to Sikkim), Assam, N. Burma, N. Thai, and W. China.

The Himalayan plants have elongate acuminate subentire leaves with a longer petiole. The type of *Osmanthus fragrans* Loureiro in the British Museum has shorter broader elliptic leaves with minute serration.

Osmanthus suavis King ex C. B. Clarke in Fl. Brit. Ind. **3**: 607 (1882)–P. S. Green in Not. Bot. Gard. Edinb. **22**: 530 (1958).

Siphonosmanthus suavis (King ex Clarke) Stapf in Bot. Mag. t. 9176 (1929).

Ramam–Phalut, 2400–2500 m (May 9, 1960, fl.); Chia Bhanjang–Dentam, 3000 m (May 11, 1960, fl.); Hati Sar–Minchin Dhap, 2700–2900 m (Oct. 28, 1963, fr.); Minchin Dhap–Mul Pokhari, 2800–2400 m (Oct. 29, 1963, fr.); Thakma Khola, 3000 m (Nov. 13, 1963, fr.); Diorali Bhanjang, 3500 m (Nov. 17, 1963, fr.); Siling Tzokupa, 3800 m (Nov. 21, 1963); Bhuspate Danra, 2800 m (Dec. 2, 1963).

Distr. E. Himalaya (Nepal to Bhutan), N. Assam, Manipur, S. Tibet, N. Burma, and W. China (Yunnan).

LOGANIACEAE (by Takasi Yamazaki)

Mitreola oldenlandioides Wallich in DC., Prodr. **9**: 9 (1845)–Hooker, Icon. Pl. t. 827 (1852)–Fl. Brit. Ind. **4**: 79 (1883).

Dhara Pani–Dhankuta, 900–1200 m (Oct. 17, 1963, fr.).

Distr. Himalaya, India, Burma, Indo-China, and Malaya.

BUDDLEJACEAE (by Takasi Yamazaki)

Buddleja asiatica Loureiro, Fl. Cochinch. 72 (1790)–Fl. Brit. Ind. **4**: 82 (1883)–Marquand in Kew Bull. **1930**: 195 (1930).

Mani Bhanjang–Batasi, 2000 m (May 1, 1960, fr.); Tista–Rangpo, 350 m (Mar. 17, 1963, fl. white); Singtam–Temi, 400–1700 m (Mar. 25, 1963); Rabong La–Lower Road, 2100–1000 m (Mar. 28, 1963, fl. white); Taplejung, 1700 m (Nov. 2, 1963); Birwa–below Yektin, 2400–1400 m (Nov. 28, 1963); Dhara Pani–Illam, 1500–1200 m (Dec. 5, 1963); Illam, 1200 m (Dec. 7, 1963).

Distr. Himalaya, India, Burma, Indo-China, Malaysia, C. & S. China, and Formosa.

Buddleja Colvilei Hooker f. et Thomson in Hook., Ill. Himal. Pl. t. 18 (1855)–Fl. Brit. Ind. **4**: 81 (1883)–Marquand, l.c. 187 (1930).

Garibans–Tonglu, 2800-3000 m (Jun. 7, 1960, fl.); Bhuspate Danra–Mai Majuwa, 2900–1600 m (Dec. 3, 1963, fr.); Sandakphu–Garibans, 3600–2800 m (Sep. 17, 1964, fr.).

Distr. E. Himalaya (E. Nepal, Sikkim), and Tibet.

GENTIANACEAE (by Hiroshi Hara)

Canscora decussata (Roxb.) J.A. et J.H. Schultes, Syst. Veg. Mant. **1**: 229 (1822)–Fl. Brit. Ind. **4**: 104 (1883).

Pladera decussata Roxburgh, Fl. Ind. ed. Carey, **1**: 418 (1820).

Ranga Pani–Ghorwa, 700–300 m (Dec. 9, 1963, fl., fr.); Sibganja–Gauriganja, 200 m (Dec. 12, 1963, fl.); Mahara Bahara–Kathgara, 200 m (Dec. 13, 1963, fl.).

Distr. Africa, tropical Himalaya, India, and Burma.

Exacum tetragonum Roxburgh, Fl. Ind. ed. Carey, **1**: 413 (1820)–Fl. Brit. Ind. **4**: 95 (1883).

Above Helok, 1700 m (Nov. 8, 1963, fr., fl.).

Distr. Himalaya (Kumaon to Bhutan), Khasia, and China.

Gentiana bryoides Burkill in Journ. Asia. Soc. Beng. n.s. **2**: 316 (1906)–Marquand in Kew Bull. **1937**: 188 (1937).

G. stylosa Biswas in Hook., Icon. Pl. t. 3358, f. 1–7 (1938).

Sandakphu, 3600 m (May 7, 1960, fl., fr.); Bakkim–Jongri, 2500–4000 m (May 19, 1960, fl.); Gamothang, 3800 m (May 29, 1960, fl.); Gamothang—Migothang, 3900 m (May 30, 1960, fl.); Migothang–Nayathang (Jun. 1, 1960, fl.); Chia Bhanjang–Phalut, 3200 m (Jun. 3, 1960, fr.); Phalut, 3500 m (May 9, 1960, fl.).

Distr. E. Himalaya (E. Nepal, Sikkim), and S. Tibet.

Gentiana capitata Hamilton ex D. Don, Prodr. Fl. Nepal. 126 (1825)–Fl. Brit. Ind. **4**: 113 (1883).

G. cephalodes Edgeworth in London Journ. Bot. **4**: 637, t. 20, ut *G. Baconi* (1845); in Trans. Linn. Soc. **20**: 84 (1846).

Senchal, 2300 m (Apr. 6, 1960, fl.); Batasi–Palmajua, 2300–2600 m (May 3, 1960, fr.); Tendong Peak, 2500 m (Mar. 26, 1963, fl.); Damthang–Rabong La, 2300 m (Mar. 28, 1963, fl.); Kakani, 2200 m (Sep. 24, 1963, fl.); Sinduwa, 2100 m (Oct. 23, 1963); Bilbatay Bhanjang, 2200 m (Oct. 25, 1963); Baroya Khimty, 2500 m (Nov. 11, 1963); Bhandukay–Yamphodin, 2700 m (Nov. 16, 1933); Siling Tzokupa, 3000 m (Nov. 21, 1963).

Distr. Himalaya (Kumaon to Bhutan), N. Assam, and N. Burma.

Gentiana Elwesii C. B. Clarke in Fl. Brit. Ind. **4**: 115 (1883)–Wilkie, Gentian. 60, f. 30 (1936).

Jongri–Gamothang, 3900–4200 m (May 26, 1960, no. 503).

Distr. E. Himalaya (Sikkim).

Gentiana glabriuscula H. Smith, in sched.

Bakkim–Jongri, 2500–4000 m (May 19, 1960, no. 399, fl. & fr.).

Distr. E. Himalaya.

Gentiana kumaonensis Biswas in Hook., Icon. Pl. t. 3359, f. 10–16 (1938).

G. capitata var. *strobiliformis* C. B. Clarke in Fl. Brit. Ind. **4**: 113 (1883).

Sandakphu, 3600 m (May 7, 1960, fr.); Choktsering Chu, Jongri, 4000–4500 m (May 25, 1960, fl.); Gamothang, 4100 m (May 29, 1960, fr.); Halhale Bhanjang, 2800 m (Dec. 1, 1963).

Distr. Himalaya (Kumaon to Bhutan).

Var. *strobiliformis* is considered to be specifically separated from *G. capitata*, and its typical form has very densely foliated short epigaeus stems and depressedround leaves with white-scarious margin. But a few individuals of our collections are not distinguishable from the original figure of *G. kumaonensis*, so they are here tentatively referred to the species.

Gentiana pedicellata (D. Don) Wallich ex Grisebach, Gent. 273 (1838)–DC., Prodr. **9**: 107 (1845)–Marquand in Kew Bull. **1937**: 190 (1937).

Ericala pedicellata D. Don in Philos. Mag. 1836: 76; in Trans. Linn. Soc. **17**: 514 (1837).

Ericala procumbens D. Don ex G. Don, Gen. Hist. **4**: 192 (1837).

G. quadrifaria Blume sensu Fl. Brit. Ind. **4**: 111 (1883), p.p.

G. quadrifaria var. *pilosula* C. B. Clarke, l.c. 112 (1883).

G. squarrosa Ledeb. sensu Fl. Brit. Ind. **4**: 111 (1883), p.p.–Kitamura, Faun. & Fl. Nepal Himal. 205 (1955).

Senchal, 2400 m (Apr. 16 & 17, 1960, fl. & fr.); Darjeeling, 2150 m (Apr. 1, 2, 4 & 8, 1960; Mar. 14, 1963); Mani Bhanjang–Batasi, 1700 m (May 1, 1960); Kalimpong, 1300 m (Apr. 23, 1960); Dentam–Pamianchi, 1500–2000 m (May 16, 1960); Kurseong, 1550 m (Apr. 12, 1960); Baroya Khimty, 2500 m (Nov. 11, 1963, bud); Khunga–Yektin (Nov. 28, 1963); Bhuspate Danra, 2600 m (Dec. 2, 1963); Tendong Peak, 2700 m (Mar. 26, 1963).

Distr. Himalaya (Kashmir to Bhutan), and Khasia.

The flowers are light blue or rarely white.

Gentiana prolata Balfour f. in Trans. Bot. Soc. Edinb. **27**: 266 (1918)–Bot. Mag. t. 9311 (1933)–Wilkie, Gentian. 104, f. 58 (1936).

G. ornata Wall. sensu Fl. Brit. Ind. **4**: 116 (1883) p.p.

Jongri, 4000 m (May 21, 1960); Jongri–Gamothang, 4200–3600 m (May 26, 1960).

Distr. E. Himalaya (Sikkim, Bhutan).

Gentiana sikkimensis C. B. Clarke in Fl. Brit. Ind. **4**: 114 (1883)–Wilkie, Gentian. 123, f. 69 (1936)–Kew Bull. **1937**: 162 & 185 (1937).

Jongri, 4100 m (May 21, 1960); Siling Tzokupa, 3100 m (Nov. 21, 1963, fr.).

Distr. E. Himalaya (E. Nepal, Sikkim), S. Tibet, and Yunnan.

Gentiana speciosa (Wall.) Marquand in Kew Bull. **1931**: 70 (1931). [Pl. 4 b]

Crawfurdia speciosa Wallich, Tent. Fl. Napal. 64, t. 48 (1826)–Fl. Brit. Ind. **4**: 106 (1883)–H. Smith in Not. Bot. Gard. Edinb. **26**: 244, figs. (1965).

Tinjuray–Hati Sar, 2800 m (Oct. 27, 1963, fl.); Hati Sar–Minchin Dhap, 2700–2900 m (Oct. 28, 1963, fl.); Minchin Dhap–Mul Pokhari, 2900–2500 m (Oct. 29, 1963, fl.); Bhandukay, 2500 m (Nov. 15, 1963, fl.); below Siling Tzokupa, 2100–2900 m (Nov. 21, 1963, fl.); Birwa–Yektin, 2000–2900 m (Nov. 28, 1963, fl., fr.); Gatribas–Tonglu, 2900 m (Sep. 17, 1964, bud).

Distr. E. Himalaya (Nepal to Bhutan), Assam, Manipur, S. Tibet, and N. Burma.

I refer this species to the genus *Gentiana*. In general appearance especially in its twining stem, the species resembles the genus *Tripterospermum*, but in the structure of flowers, fruits, and seeds, and the surface pattern of pollen grains, it is quite different from *Tripterospermum*, and agree with *Gentiana*.

Gentiana stylophora C. B. Clarke in Fl. Brit. Ind. **4**: 118 (1883)–Skan in Hooker, Icon. Pl. **30**: t. 2992 (1913)–W. W. Smith, Alp. Veg. SE. Sikkim 396 (1913)–Spring Fl. Sikkim Himal. f. 22 & 25 (1963).

Megacodon stylophorus (Clarke) H. Smith in Handel-Mazzetti, Symb. Sin. **7**: 950 (1936).

Gamothang, 3750 m (May 27, 1960, no. 505, fl.).

Distr. E. Himalaya (Sikkim, Bhutan), S. Tibet, and W. China.

The genus *Megacodon* was established by H. Smith in 1936 without description based on *Gentiana* sect. Megacodon Hemsley (1890), but the only species cited there was *Megacodon stylophorus* (Clarke) H. Smith. However, sect. Megacodon Hemsley includes only *Gentiana venosa* Hemsley, so the type of the genus *Megacodon* is automatically *G. venosa*. I presume, H. Smith was of opinion that *Gentiana stylophora* Clarke together with *G. venosa* Hemsley constitute a separate genus from *Gentiana*.

G. stylophora, the type of another section Stylophora Clarke (1883), resembles *G. venosa* in its general appearance and in its large yellowish corollae naked inside, but it clearly differs from the latter by infundibuliform calyx-tube.

Halenia elliptica D. Don in Trans. Linn. Soc. **17**: 529 (1837)–Fl. Brit. Ind. **4**: 130 (1883).

Hati Sar, 2800 m (Oct. 27, 1963, fl. & fr.); Hati Sar–Minchin Dhap, 2700–2900 m (Oct. 28, 1963, fr.); Minchin Dhap–Mul Pokhari, 2900–2500 m (Oct. 29, 1963, fr.); Zongi–Walunchung Gola, 2800–3800 m (Nov. 10, 1963, fr.); Tonglu, 3000 m (Sep. 16, 1964, fl.).

Distr. Himalaya (Kashmir to Bhutan), S. Tibet, and W. China.

Nymphoides cristatum (Roxb.) O. Kuntze, Rev. Gen. Pl. **2**: 429 (1891), ut *Nymphodes*.

Menyanthes cristata Roxburgh, Pl. Corom. **2**: 3, t. 105 (1799).

Limnanthemum cristatum (Roxb.) Grisebach, Gent. 342 (1839)–Fl. Brit. Ind. **4**: 131 (1883).

Sibganja–Gauriganja, 200 m (Dec. 12, 1963, fl. & fr.).

Distr. India, east to S. China, and Formosa.

Swertia angustifolia Hamilton ex D. Don, Prodr. Fl. Nepal. 127 (1825)–Fl. Brit. Ind. **4**: 125 (1883)–Burkill in Journ. Asia. Soc. Beng. n.s. **2**: 373 (1906), var. *Wallichiana* Burkill.

Dhara Pani–Tamur Bridge, 800 m (Oct. 17, 1963, fl.); Ranga Pani–Ghorwa, 700–300 m (Dec. 9, 1963, fl. & fr.).

Distr. sp. Himalaya (Kashmir to Bhutan), India, Burma, Indo-China, and W. & C. China.

Swertia bimaculata (Sieb. et Zucc.) Hook. f. et Thomson ex C. B. Clarke in Journ. Linn. Soc. **14**: 449 (1875)–Fl. Brit. Ind. **4**: 123 (1883)–Hara, Enum. Sperm. Jap. **1**: 140 (1949).

Ophelia bimaculata Sieb. et Zucc. in Abh. Akad. Wiss. Muench. **4** (3): 159 (1846).

S. bimaculata var. *macrocarpa* Nakai in Bot. Mag. Tokyo **47**: 262 (1933).

Dentam–Pamianchi, 2000 m (May 12, 1960, fl.); Tendong Peak, 2700 m (Mar. 26, 1963, fr.); Murhay–Chitray, 2000–2100 m (Oct. 23 & 24, 1963, fl., fr.); Bilbatay Bhanjang, 2200 m (Oct. 25 & 26, 1963, fl.); Minchin Dhap–Mul Pokhari, 2900–2500 m (Oct. 29, 1963, fr.); Zongi–Iladanda, 2800–1800 m (Nov. 12, 1963, fr.); Chyangthaphu–Birwa, 1300–2400 m (Nov. 27, 1963, fr.); Penlong La, 2100 m (Sep. 13, 1964, fl.).

Distr. E. Himalaya (Nepal to Bhutan), N. Burma, C. & S. China, and Japan.

The Himalayan specimens agree well with the Japanese ones.

Swertia Chirayita (Roxb.) Karsten, Deuts. Fl. 1025 (1880–83)-Hamilton ex C. B. Clarke in Fl. Brit. Ind. **4**: 124 (1883), ut *Chirata*-Burtt in Not. Bot. Gard. Edinb. **26**: 274 (1965).

Gentiana Chirayita Roxb. apud Fleming in Asiat. Research. **11**: 167 (1810).

G. Cherayta Roxb., Fl. Ind. ed. 2, **2**: 71 (1832).

G. Chirata Wall., Pl. Asia. Rar. **3**: 33, t. 252 (1832).

Agathotes Chirayita (Roxb.) D. Don ex G. Don, Gen. Hist. **4**: 178 (1837)-D. Don in Trans. Linn. Soc. **17**: 522 (1837), ut *Chirayta*.

Ophelia Chirata (Roxb.) Griseb., Gent. 320 (1839)-DC., Prodr. **9**: 127 (1845).

Swertia tongluensis Burkill in Journ. Asia. Soc. Beng. n.s. **2**: 319 (1906); **3**: 33 (1907).

Murhay, 2100 m (Oct. 23, 1963, fl.); Sinduwa, 2100 m (Oct. 24, 1963, fl.); Bilbatay Bhanjang, 2200 m (Oct. 25 & 26, 1963, fl.); Hati Sar–Minchin Dhap, 2700–2900 m (Oct. 28, 1963, fr.); Minchin Dhap–Mul Pokhari, 2900–2500 m (Oct. 29, 1963, fr.); Helok, 1500 m (Nov. 7, 1963, fr.); Lelep, 2500 m (Nov. 9, 1963); Baroya Khimty–Thakma Khola, 2500–3000 m (Nov. 12 & 16, 1963, fr.); Siling Tzokupa, 3800 m (Nov. 21, 1963, fl.); Chyangthaphu, 1800 m (Nov. 27, 1963, fl.); Birwa–below Yektin, 2400–1400 m (Nov. 28, 1963, fr.); Senchal–Ghum, 2300 m (Sep. 19, 1964, fl.).

Distr. Himalaya (Kashmir to Bhutan), and Khasia.

Swertia dilatata C. B. Clarke in Fl. Brit. Ind. **4**: 122 (1883).

Murhay–Chitray, 2000–2100 m (Oct. 22–24, 1963, fl.); Bilbatay Bhanjang–Hati Sar, 2500–2700 m (Oct. 27, 1963, fl.); Minchin Dhap–Mul Pokhari, 2900–2500 m (Oct. 29, 1963, fl.); Baroya Khimty, 2500 m (Nov. 11, 1963, fl.); Bhandukay, 2400 m (Nov. 15, 1963, fl.); Yektin–Batasay, 2000–2400 m (Nov. 30, 1963, fr.); Batasay–Bhuspate Danra, 2400–2800 m (Dec. 1, 1963, fr.); Mai Majuwa–Dhara Pani, 1900–1500 m (Dec. 4, 1963, fr.); Gatribas–Kala Pokhari, 2800–3200 m (Sep. 16, 1964, fl.); Senchal, 2400 m (Sep. 19, 1964, fl.).

Distr. E. Himalaya (Nepal, Sikkim).

Swertia macrosperma (Clarke) C. B. Clarke in Fl. Brit. Ind. **4**: 123 (1883).

Ophelia macrosperma C. B. Clarke in Journ. Linn. Soc. **14**: 448 (1875).

Mihchin Dhap, 2800 m (Oct. 29, 1963, fl. & fr.).

Distr. E. Himalaya (Nepal), and Khasia.

Swertia nervosa (D. Don) C. B. Clarke in Fl. Brit. Ind. **4**: 125 (1883)-Burkill, l.c. 372 (1906)-Burtt in Not. Bot. Gard. Edinb. **26**: 274 (1965).

Agathotes nervosa D. Don ex G. Don, Gen. Hist. **4**: 177 (1837).

Godavari, Kathmandu, 1500 m (Sep. 18, 1963, bud); Hilay–Murhay, 2000 m (Oct. 22 & 23, 1963, fl.); Taplejung, 1900 m (Nov. 1, 1963, fl.); Tuwa–Taplethok, 1800–1400 m (Nov. 5, 1963); Helok, 1500 m (Nov. 8, 1963, fr.); Baroya Khimty, 2500 m (Nov. 12 & 16, 1963, fr.); Ghatte–Khebang, 2400–1600 m (Nov. 19, 1963, fr.).

Distr. Himalaya (Simla to Sikkim), Khasia, Naga Hills, and W. China.

Swertia pedicellata Banerji in Kew Bull. **1924**: 263 (1924).

S. purpurascens var. *ramosa* Burkill in Journ. Asia. Soc. Beng. n.s. **3**: 34 (1907).

Tinjuray–Hati Sar, 2900–2700 m (Oct. 27, 1963, fr.); Hati Sar–Mangalbare, 2700–2900 m (Oct. 28, 1963, fr.); Minchin Dhap–Mul Pokhari, 2900–2500 m (Oct. 29, 1963, fr.); Senchal, 2400 m (Sep. 19, 1964, fl.).

Distr. E. Himalaya (E. Nepal, Darjeeling).

Tripterospermum nigrobaccatum Hara in Journ. Jap. Bot. **40**: 19 (1965). [Pl. 4 d]

Tinjuray–Hati Sar, 2800 m (Oct. 27, 1963, fr.); Hati Sar–Minchin Dhap, 2800 m Oct. 28, 1963); Minchin Dhap–Mul Pokhari, 2800 m (Oct. 29, 1963, fr.—Typus); Siling Tzokupa, 3000 m (Nov. 21, 1963, fr.); Halhare Bhanjang, 2700 m (Dec. 1, 1963, fr.).

Distr. E. Himalaya (E. Nepal).

The species is clearly distinguished from *T. volubile* in having smaller flowers, shorter unwinged calyx-tubes, and smaller black ellipsoid berries.

Tripterospermum volubile (D. Don) Hara in Journ. Jap. Bot. **40**: 21 (Jan. 1965)–H. Smith in Not. Bot. Gard. Edinb. **26**: 244 (Mar. 1965). [Pl. 4 c]

Gentiana volubilis D. Don, Prodr. Fl. Nepal. 126 (1825)–Sealy in Kew Bull. **1949**: 316 (1949).

Crawfurdia fasciculata Wall., Tent. Fl. Napal. 63, t. 47, f. 1–5 (1826), p.p.

C. luteoviridis C. B. Clarke in Journ. Linn. Soc. **14**: 443 (1874)–Bot. Mag. t. 6539 (1881).

C. japonica var. *luteoviridis* (Clarke) C. B. Clarke in Fl. Brit. Ind. **4**: 108 (1883).

C. affinis Wall. sensu C. B. Clarke, l.c. 107 (1883).

Gentiana confusa Marquand in Kew Bull. **1931**: 70 (1931).

G. luteoviridis (C. B. Clarke) Marquand, l.c. (1931); **1937**: 157 (1937).

Sinduwa–Chitray, 2100 m (Oct. 24, 1963, fl., fr.); Bilbatay Bhanjang–Hati Sar, 2200–2900 m (Oct. 27, 1963, fr.); Minchin Dhap–Mul Pokhari, 2900–2500 m (Oct. 29, 1963, fr.); Ghatte, 1300 m (Nov. 17, 1963, fr.); Siling Tzokupa, 2100–2800 m (Nov. 21, 1963, fr.); Birwa–Yektin, 2900–2000 m (Nov. 28, 1963, fr.); near Akasay, 2200 m (Nov. 30, 1963, fr.); Batasay–Bhuspate Danra, 2400–2800 m (Dec. 1, 1963, fr.); Mai Majuwa–Dhara Pani, 1900–1500 m (Dec. 4, 1963, fr.); Senchal–Ghum, 2400–2350 m (Dec. 27, 1963; Sep. 19, 1964, fl.).

Distr. sp. Himalaya (Jaunsar to Bhutan), S. Tibet, Assam, N. Burma, and W. China.

The status of the genus and the species is discussed on p. 650.

APOCYNACEAE (by Takasi Yamazaki)

Alstonia neriifolia D. Don, Prodr. Fl. Nepal. 131 (1825)–Hooker f., Fl. Brit. Ind. **3**: 642 (1882).

Phusri–Dhara Pani, 450–900 m (Oct. 16, 1963, fr.); Bharomdin–Tharpu, 1000–1200 m (Nov. 25, 1963, fr.); Yektin, 1100 m (Nov. 29, 1963, fr.).

Distr. Tropical Himalaya (Nepal, Sikkim).

Beaumontia grandiflora Wallich, Tent. Fl. Napal. 15, t. 7 (1824)–Fl. Brit Ind. **3**: 660 (1882).

Naya Bazar–Namchi, 1200 m (Mar. 27, 1963, fl. white, yellowish green at the base).

Distr. E. Himalaya (Nepal, Sikkim).

Cathranthus roseus (L.) G. Don, Gen. Hist. **4**: 95 (1837).

Vinca rosea L., Syst. Nat. ed. 10, 944 (1759)–Fl. Brit. Ind. **3**: 640 (1882).

Lochnera rosea (L.) Reichb., Consp. Reg. Veg. 134 (1828).

Mul Pokhari–Dumhan, 2400–700 m (Oct. 30, 1963, fl.).

Distr. Native of tropical America; cultivated and naturalized throughout the tropics.

Chonemorpha macrophylla G. Don, Gen. Hist. **4**: 76 (1837)–Fl. Brit. Ind. 3: 661 (1882).

Pamianchi–Tingling Bridge, 1000–2000 m (May 15, 1960, fr.); Khebang–Bharomdin, 1700–1000 m (Nov. 24, 1963, fr.); Tharpu–Chyangthaphu, 1200–1100 m (Nov. 26, 1963, fr.).

Distr. Throughout India, Malacca, Andaman, Malaya, Sumatra, and Java.

Holarrhena antidysenterica Wallich ex DC., Prodr. **8**: 413 (1844)–Fl. Brit. Ind. **3**: 644 (1882)–Pitard in Fl. Gén. Indo-Chin. **3**: 1169 (1933).

Malda–Siliguri (Apr. 28, 1960, fl.); Kurseong, 1100 m (Apr. 29, 1960, fl.); Phusri–Dhara Pani, 450–900 m (Oct. 16, 1963, fr.); Yektin, 1100 m (Nov. 29, 1963); Ranga Pani-Ghorwa, 700–300 m (Dec. 9, 1963, fr.); Sanichare–Sibganja, 200 m (Dec. 11, 1963, fr.); Dharan, 200 m (Dec. 11, 1963); Sibganja–Mahara Bahara, 200 m (Dec. 12, 1963, fr.).

Distr. Throughout India, Burma, Indo-China, and Malaya.

Ichnocarpus frutescens R. Br. in Aiton, Hort. Kew. ed. 2, **2**: 69 (1811)–Fl. Brit. Ind. **3**: 669 (1882).

Dhara Pani-Dhankuta, 900-1200 m (Oct. 17, 1963, fl.).

Distr. Throughout India, Burma, Indo-China, and Malaya.

Plumeria acutifolia Poiret in Lamarck, Encycl. Suppl. **2**: 667 (1812)–Fl. Brit. Ind. **3**: 641 (1882).

Ranga Pani–Ghorwa, 700–300 m (Dec. 9, 1963, fl.).

Distr. Native of tropical America, cultivated and naturalized in the tropics.

Rauwolfia serpentina Bentham ex Kurz, For. Fl. Brit. Burma **2**: 171 (1877)–Fl. Brit. Ind. **3**: 632 (1882)–Sulochana in Journ. Ind. Bot. Soc. **38**: 578 (1959).

Ophioxylon serpentinum L., Sp. Pl. ed. 2, 1748 (1763).

Rayang, cult., 250 m (Apr. 22, 1960, no. 1950, fl.).

Distr. Throughout India, Indo-China, Burma, Malaya, and Java.

Tabernaemontana divaricata (L.) R. Br. ex Roem. et Schult., Syst. Veg. **4**: 427 (1819)–Merrill, Enum. Philip. Pl. **3**: 324 (1923).

Nerium divaricatum L., Sp. Pl. ed. 1, 209 (1753).

Tabernaemontana coronaria R. Br. sensu Hooker f., Fl. Brit. Ind. **3**: 646 (1882).

Takdah–Rayang, cult., 1600–250 m (Apr. 20, 1960, fl.); Kurseong, 1550 m (Apr. 29, 1960, fl.); Siliguri–Kurseong (Apr. 29, 1960, fl.); Dumhan, Taplejang Distr., 700 m, cult. (Oct. 31, 1963, fl. white).

Distr. Native of tropical Asia, pantropic in cultivation.

Thevetia peruviana (Pers.) Merr. in Philip. Journ. Sci. **9**: 130 (1914); Enum. Philip. Pl. **3**: 330 (1923).

Cerbera peruviana Pers., Syn. Pl. **1**: 267 (1805).

Thevetia nereifolia Juss. ex Steud., Nom. Bot. ed. 2, **2**: 680 (1841)–Haines, Bot. Bihar Orissa **4**: 535 (1922).

Biratnagar, 200 m (Oct. 14, 1963).

Distr. Native of tropical America; cultivated and semi-wild in the tropics.

Trachelospermum lucidum (D. Don) K. Schumann in Engler, Pfl.-fam. IV, **2**: 173 (1895).

Alstonia lucida D. Don, Prodr. Fl. Nepal. 131 (1825).

Ichnocarpus fragrans Wall. in DC., Prodr. **8**: 435 (1844).

Trachelospermum fragrans (Wall.) Hooker f., l.c. **3**: 667 (1882).

Yoksam, 1700 m (May 17, 1960); Taplethok–Helok, 1300–1500 m (Nov. 6, 1963).

Distr. Temperate and subtropical Himalaya (Kumaon to Assam).

Wrightia sikkimensis Gamble in Kew Bull. **1908**: 447 (1908)–Nagan in Ann. Miss. Bot. Gard. **52**: 146 (1965).

Dentam–Pamianchi, 2000 m (May 12, 1960, fl.).

Distr. E. Himalaya (Sikkim), and China (Kwangsi, Kweichow).

Wrightia tomentosa (Roxb.) Roem. et Schultes, Syst. Veg. **4**: 414 (1819)–Fl. Brit. Ind. **3**: 653 (1882)–Pichon in Not. Syst. **14**: 82 (1951)–Nagan in Ann. Miss. Bot. Gard. **52**: 147 (1965).

Nerium tomentosum Roxb., Fl. Ind. ed. Carey, **2**: 6 (1824).

Tista (Apr. 26, 1960); Ranga Pani–Ghorwa, 700–300 m (Dec. 9, 1963, fr.).

Distr. Throughout India, Burma, Thai, Indo-China, and S. China.

ASCLEPIADACEAE (by Hiroshi Hara)

Asclepias curassavica L., Sp. Pl. ed. 1, **1**: 215 (1753)–Fl. Brit. Ind. **4**: 18 (1883)–Santapau et Irani in Bot. Mem. Univ. Bombay **4**: 15 (1962).

Dumhan–Taplejung, 1300 m (Nov. 1, 1963, fl.); Tharpu–Chyangthaphu, 1200–1300 m (Nov. 26, 1963, fl.); below Yektin, 1400 m (Nov. 29, 1963, fl., fr.).

Distr. Native of tropical America; naturalized in tropics.

Calotropis Acia Hamilt. in Trans. Linn. Soc. **14**: 247 (1824)–Fl. Brit. Ind. **4**: 18 (1883).

Sibganja–Mahara Bahara, 200 m (Dec. 12, 1963, fr.).

Distr. Tropical Himalaya, and Assam.

Calotropis gigantea (L.) Dryand. in Aiton, Hort. Kew. ed. 2, **2**: 78 (1811)–Fl. Brit. Ind. **4**: 17 (1883)–Bot. Mag. t. 6862 (1886)–Santapau et Irani, l.c. 17 (1962).

Asclepias gigantea L., Sp. Pl. ed. 1, **1**: 214 (1753).

Dhara Pani–Tamur Bridge, 300 m (Oct. 17, 1963); Bharomdin–Tharpu, 700–1200 m (Nov. 25, 1963, fl.); Ranga Pani–Ghorwa, 700–300 m (Dec. 9, 1963, fl.); Kathgara–Rangali, 200 m (Dec. 14, 1963, fl.); Rangali–Biratnagar, 200 m (Dec. 15, 1963, fl.).

Distr. Tropical Himalaya, India, east to S. China, and Malaysia.

Ceropegia pubescens Wallich, Pl. Asia. Rar. **2**: 81, t. 187 (1831)–Fl. Brit. Ind. **4**: 73 (1883)–Huber in Mem. Soc. Broter. **12**: 47 (1957).

Darjeeling, 2000 m (Jun. 21, 1960, fl.).

Distr. E. Himalaya (Nepal to Bhutan), Khasia, Naga Hills, S. Tibet, N. Burma, and W. China (Yunnan).

Cryptolepis sinensis (Lour.) Merrill in Philip. Journ. Sci. **15**: 254 (1919); in Trans. Amer. Philos. Soc. n.s. **24** (2): 316 (1935)–Kew Bull. **1955**: 282 (1955), in adnota–Li, Woody Fl. Taiwan 797, f. 321 (1963).

Pergularia sinensis Loureiro, Fl. Cochinch. 169 (1790).

Cryptolepis elegans Wall. ex G. Don, Gen. Hist. **4**: 82 (1837)–Fl. Brit. Ind. **4**: 6 (1883)–Kerr in Fl. Siam. Enum. **3**: 2 (1951).

Kurseong–Siliguri, 1500–300 m (Jun. 29, 1960, fl.).

Distr. Tropical E. Himalaya, India, east to S. China and Formosa, and Malaysia.

Dregea volubilis (L. f.) Bentham ex Hook. f., Fl. Brit. Ind. **4**: 46 (1883)-Bakh. f. in Blumea **6**: 373 (1950)-Santapau et Irani, l.c. 42, t. 6 (1962).

Asclepias volubilis L. f., Suppl. Pl. 170 (1781).

Wattakaka volubilis (L. f.) Stapf in Bot. Mag. sub t. 8976 (1923).

Sibganja–Mahara Bahara, 200 m (Dec. 12, 1963, fr.).

Distr. Tropical Himalaya, India, east to S. China and Formosa, and Malaysia.

Hoya Edeni King ex Hook. f., Fl. Brit. Ind. **4**: 53 (1883).

Mul Pokhari–Nissim, 1600–1900 m (Oct. 30, 1963, fl.); Chyangthaphu–Birwa, 1300–2400 m (Nov. 27, 1963, fr.); Birwa–Yektin, 2900–1600 m (Nov. 28, 1963).

Distr. E. Himalaya (Nepal, Sikkim), and Manipur.

Hoya fusca Wallich, Pl. Asia. Rar. **1**: 68, t. 75 (1830)-Fl. Brit. Ind. **4**: 58 (1883)-Tsiang in Sunyat. **3**: 172 (1936).

Yektin–Akasay, 1400–2300 m (Nov. 30, 1963, fr.); Damthang–Temi, 2200–1800 m (Mar. 25, 1963, fr.).

Distr. E. Himalaya (Nepal, Sikkim), Khasia, Burma, Thai, Indo-China, and S. China.

Hoya lanceolata Wallich ex D. Don, Prodr. Fl. Nepal. 130 (1825)-Fl. Brit. Ind. **4**: 54 (1883).

Gangtok, 1500 m (Jun. 16, 1960, fl.; Mar. 18, 1963, fr.); Taplethok, 1400 m (Nov. 5, 1963, fr.); Taplethok–Helok, 1400–1500 m (Nov. 6, 1963, fr.); Khebang–Siling Tzokupa, 1700–2100 m (Nov. 20, 1963, fr.).

Distr. Himalaya (Kumaon to Bhutan), and Khasia.

Hoya linearis Wallich ex D. Don, Prodr. Fl. Nepal. 130 (1825)-Bot. Mag. t. 6682 (1883)-Fl. Brit. Ind. **4**: 53 (1883).

Takdah, 1700 m (Apr. 18, 1960, fr.); Yoksam–Bakkim, 2000 m (May 18, 1960, fr.); Gangtok, 1500 m (Mar. 24, 1963, fr.); Damthang–Temi, 2000 m (Mar. 25, 1963); Ghatte–Khebang, 1600–2400 m (Nov. 19, 1963).

Distr. E. Himalaya (Nepal to NEFA), and N. Burma.

Hoya longifolia Wallich ex Wight, Contr. 36 (1837)-Fl. Brit. Ind. **4**: 56 (1883).

Yoksam, 1700 m (May 17, 1960, fl.) Yoksam–Bakkim, 1700 m (May 18, 1960); Yektin–Akasay, 1400–2300 m (Nov. 30, 1963).

Distr. Himalaya (Kumaon to Sikkim), Khasia, Manipur, and Thai.

Hoya serpens Hook. f., Fl. Brit. Ind. **4**: 55 (1883).

Dentam–Pamianchi, 1700 m (May 12, 1960, fl.).

Distr. E. Himalaya (Sikkim).

Marsdenia Calesiana Wight, Contr. 41 (1837)-Fl. Brit. Ind. **4**: 37 (1883).

Tharpu–Chyangthaphu, 1200–1300 m (Nov. 26, 1963, fr.).

Distr. E. Himalaya (Nepal, Sikkim).

Marsdenia lucida Edgew. ex Madden in Journ. Asia. Soc. Beng. **17** (1): 370 (1848)-Fl. Brit. Ind. **4**: 36 (1883).

Hati Sar, 2700 m (Oct. 27, 1963, fl. dark purple).

Distr. Himalaya (Kumaon, Nepal).

Marsdenia Roylei Wight, Contr. 40 (1837)-Fl. Brit. Ind. **4**: 35 (1883)-Collett, Fl. Siml. 318, f. 99 (1921).

Tuwa–Taplethok, 1800–1400 m (Nov. 5, 1963, fr.).

Distr. Himalaya (Simla to Sikkim).

Marsdenia tinctoria R. Brown in Mem. Wern. Soc. **1**: 30 (1810)–Fl. Brit. Ind. **4**: 34 (1883)–Tsiang in Sunyat. **3**: 195 (1936)–Kerr in Fl. Siam. Enum. **3**: 29 (1951).

Bharomdin–Tharpu, 700–1200 m (Nov. 25, 1963, fr.); Illam–Ranga Pani, 1200–400 m (Dec. 8, 1963).

Distr. Subtropical Himalaya (Nepal, Sikkim), Assam, east to S. China, and Malaysia.

Oxystelma esculentum (L. f.) J. A. Schultes, Syst. Veg. **6**: 89 (1820)–Fl. Brit. Ind. **4**: 17 (1883)–Bullock in Kew Bull. **19**: 203 (1965).

Periploca esculenta L. f., Suppl. Pl. 168 (1781).

Biratnagar, 200 m (Oct. 15, 1963, fl., fr.).

Distr. Tropical Himalaya, India, east to S. China, and Malaysia.

Pergularia Daemia (Forsk.) Chiov., Result. Sci. Miss. Stefan.-Paoli Somal. Ital. **1**: 115 (1916)–Santapau et Irani in Bot. Mem. Univ. Bombay **4**: 74 (1962).

Asclepias Daemia Forsk., Fl. Aegyp.-Arab. 51 (1775).

Cynanchum cordifolium Retz., Obs. Bot. **2**: 15 (1781).

C. extensum Jacquin, Misc. **2**: 353 (1782); Icon. Pl. Rar. **1**: t. 54 (1782).

Daemia extensa (Jacq.) R. Brown in Mem. Wern. Soc. **1**: 50 (1810)–Fl. Brit. Ind. **4**: 20 (1883).

Daemia cordifolia (Retz.) K. Schum. ex Engl. in Abh. Preuss. Akad. Wiss. **1894**: 17 (1894).

Biratnagar, 200 m (Oct. 14, 1963, fl.).

Distr. Tropical Africa, Arabia, Afghanistan, tropical Himalaya, India, Burma, and Malay.

Periploca calophylla (Wight) Falconer in Proc. Linn. Soc. **1**: 115 (1841)–Fl. Brit. Ind. **4**: 12 (1883)–Tsiang in Sunyat. **2**: 179 (1934).

Streptocaulon calophyllum Wight, Contr. 65 (1837).

Tingling Bridge–Yoksam, 1000–1700 m (May 16, 1960, no. 321); Dhara Pani–Dhankuta, 300–1200 m (Oct. 17, 1963); Taplethok–Helok, 1400–1500 m (Nov. 6, 1963, fr.); Helok–Iladanda, 1500–1800 m (Nov. 8, 1963, fr.), Ghatte, 1600 m (Nov. 17, 1963).

Distr. Himalaya (Kumaon to Sikkim), Khasia, and W. & C. China.

Raphistemma pulchellum Wallich, Pl. Asia. Rar **2**: 50, t. 163 (1831)–Fl. Brit. Ind. **4**: 19 (1883).

Gokarna Forest, Kathmandu, 1400 m (Sep. 22, 1963, fl.).

Distr. E. Himalaya (Nepal, Sikkim), Assam, Burma, Thai, Malay, and W. China (Yunnan).

Treutlera insignis Hook. f. in Hook., Icon. Pl. t. 1425 (1883)–Fl. Brit. Ind. **4**: 45 (1883).

Garibans–Tonglu, 2800–3000 m (Jun. 7, 1960, bud); Thakma Khola–Bhandukay, 3500–2500 m (Nov. 17, 1963, fl.).

Distr. E. Himalaya (E. Nepal, Sikkim), and Khasia.

Tylophora hirsuta (Wall.) Wight, Contr. 49 (1837)–Fl. Brit. Ind. **4**: 43 (1883).

Gymnema hirsutum Wall., Tent. Fl. Napal. 50 (1826).

Gokarna Forest, Kathmandu, 1400 m (Sep. 22, 1963, fl.); Dhankuta, 1200 m (Oct. 19, 1963, fr.); Nissim–Dumhan, 1100 m (Oct. 30, 1963, fr.).

Distr. Himalaya (Punjab to Sikkim), Assam, Thai, and Malay.

CONVOLVULACEAE (by Takasi Yamazaki, *Cuscuta* by Hiroshi Hara)

Argyreia atropurpurea (Wall.) Raiz in Indian Forester **84**: 471 (1958).

Convolvulus atropurpureus Wall. in Roxb., Fl. Ind. ed. Carey, **2**: 54 (1824)-Wall., Pl. Asia. Rar. **1**: 38, t. 43 (1830).

Lettsomia atropurpurea (Wall.) Clarke in Hooker f., Fl. Brit. Ind. **4**: 194 (1883).

Ranga Pani–Ghorwa, 700–300 m (Dec. 9, 1963, fr.).

Distr. E. Himalaya (Nepal, Sikkim).

Argyreia Hookeri C. B. Clarke in Hooker f., Fl. Brit. Ind. **4**: 185 (1883)-Prain in Journ. Asia. Soc. Beng. **62** (2): 89 (1894).

Biratnagar, 200 m (Oct. 14, 1963); Phusri–Dhara Pani, 450–900 m (Oct. 16, 1963, fr.); Dhara Pani–Dhankuta, 900–1200 m (Oct. 17, 1963); Khebang–Bharomdin, 1700–1000 m (Nov. 24, 1963, fr.); Tharpu–Chyangthaphu, 1200–1100 m (Nov. 26, 1963, fr.); Ranga Pani–Ghorwa, 700–300 m (Dec. 9, 1963).

Distr. E. Himalaya (Nepal to Bhutan), Assam, and Burma.

Argyreia Roxburghii Choisy, Convolv. Or. 37 (1833); in DC., Prodr. **9**: 330 (1845)-Fl. Brit. Ind. **4**: 185 (1883).

Biratnagar, 200 m (Oct. 14, 1963, young fr.); Ranga Pani–Ghorwa, 700–300 m (Dec. 9, 1963); Kathgara-Rangali, 200 m (Dec. 14, 1963, fr.).

Distr. E. Himalaya (Nepal, Sikkim), and Assam.

Argyreia setosa (Roxb.) Choisy var. **obovata** (Clarke) Yamazaki, comb. nov.

Lettsomia setosa Roxb. var. *obovata* C. B. Clarke in Hooker f., Fl. Brit. Ind. **4**: 194 (1883).

Sibganja–Gauriganja, 200 m (Dec. 12, 1963, young fr.).

Distr. E. Himalaya (Nepal).

Cuscuta reflexa Roxb., Pl. Corom. **2**: 3, t. 104 (1798)-Fl. Brit. Ind. **4**: 225 (1883)-Yuncker in Mem. Torrey Bot. Cl. **18**: 259, f. 130 A-F (1932)-Fl. Males. **4**: 393 (1953).

Sanguri Bhanjang–Dhara Pani, 1100 m (Oct. 17, 1963); Sinduwa–Chitray, 2100 m (Oct. 24, 1963); Nissim–Dumhan, 800 m (Oct. 30, 1963); Dumhan–Taplejung, 700–1900 m (Oct. 31, 1963, fl.); Iladanda–Selap, 1800–2600 m (Nov. 9, 1963); Helok-Baroya Khimty, 1500–2500 m (Nov. 10, 1963); Bhandukay–Yamphodin, 2400–2100 m (Nov. 16, 1963, fr.); below Siling Tzokupa, 2100 m (Nov. 21, 1963); Khebang–Bharomdin, 1700–1000 m (Nov. 24, 1963, fl. white); Bharomdin–Tharpu, 700–1200 m (Nov. 25, 1963, fl.); Illam, 1200 m (Dec. 6, 1963, fl.).

var. **brachystigma** Engelmann in Trans. Acad. Sci. St. Louis **1**: 519 (1859).

C. anguina Edgeworth in Trans. Linn. Soc. **20**: 87 (1851).

C. reflexa var. *anguina* (Edgew.) C. B. Clarke in Fl. Brit. Ind. **4**: 226 (1883)-Yuncker, l.c. 260, f. 130 G (1932).

? *C. Santapaui* Banerji et Das in Journ. Arn. Arb. **46**: 87, f. 1, A-H (1965).

Kalimpong, 1300 m (Apr. 23, 1960, fl.); Kakani, 2100–2200 m (Sep. 24, 1963, fl. white); Sibganja–Mahara Bahara, 200 m (Dec. 12, 1963, fl.).

Distr. sp. Afghanistan, Himalaya, India, Ceylon, east to W. China, and Malaysia (Java).

The specimens here referred to var. *brachystigma* agree with *C. Santapaui* in having smaller corollae, dorsifixed anthers, and densely fimbriate incurved appendages of stamens, but have sessile stigmas which agree with Yuncker's figure of var. *anguina*. While in typical *C. reflexa*, two stigmas are linear with a distinct style, and some specimens have fimbriate bridges of infrastaminal appendages. The relationship between this variety, the mother species and *C. Santapaui* needs a more critical study.

Ipomoea aquatica Forsk., Fl. Aegyp.-Arab. 44 (1775)–Fl. Brit. Ind. **4**: 210 (1883)–Ooststroom in Blumea **3**: 528 (1940); Fl. Males. **4**: 473 (1953).

Convolvulus repens (non L.) Vahl, Symb. Bot. **1**: 17 (1790).

Biratnagar, 200 m (Oct. 14, 1963. fl.); Mai Majuwa–Dhara Pani, 1600–1500 m (Dec. 4, 1963); Sanichare–Sibganja, 200 m (Dec. 11, 1963); Gauriganja–Rangali, 200 m (Dec. 13, 1963).

Distr. Circumtropical regions.

Ipomoea Batatas (L.) Lamarck, Tabl. Encycl. **1**: 465 (1793)–Fl. Brit. Ind. **4**: 202 (1883)–Ooststroom in Blumea **3**: 512 (1940).

Convolvulus Batatas L., Sp. Pl. ed. 1, **1**: 154 (1753).

Convolvulus edulis Thunberg, Fl. Jap. 84 (1784).

Garhi Danra–Tuwa, cult., 2200–1800 m (Nov. 4, 1963); below Siling Tzokupa–Khebang, 2100–1700 m (Nov. 22, 1963); Khebang–Bharomdin, 1700–1000 m (Nov. 24, 1963); Bharomdin–Tharpu, 1000–1200 m (Nov. 25, 1963).

Distr. Cultivated throughout the tropical–warm temperate regions.

Ipomoea cairica (L.) Sweet, Hort. Brit. 287 (1827)–Ooststroom in Blumea **3**: 542 (1940); Fl. Males. **4**: 478 (1953).

Convolvulus cairicus L., Syst. Nat. ed. 10, 922 (1759).

Ipomoea palmata Forsk., Fl. Aegyp.-Arab. 43 (1775)–Fl. Brit. Ind. **4**: 214 (1883).

Biratnagar, 200 m (Oct. 14, 1963).

Distr. Widely distributed in tropical Africa and Asia.

Ipomoea congesta R. Brown, Prodr. Fl. Nov. Holl. 485 (1810)–Ooststroom in Blumea **3**: 500 (1940).

Convolvulus indicus Burman, Ind. Univ. in Herb. Amb. **7**: 6 (1755); non Miller (1768).

Pharbitis insularis Choisy, Convolv. Orient. 57 (1833).

Ipomoea indica (Burm.) Merrill, Interpr. Herb. Amboin. 445 (1917).

Pharbitis congesta (R. Br.) Hara, Enum. Sperm. Jap. **1**: 166 (1948).

Gangtok, 1600 m (Jun. 15, 1960, fl.); Dhara Pani–Dhankuta, 900–1200 m (Oct. 17, 1963, fr.).

Distr. Circumtropical regions.

Ipomoea crassicaulis (Bentham) B. L. Robinson in Proc. Amer. Acad. Sci. **51**: 530 (1916)–Ooststroom in Blumea **3**: 569 (1940); Fl. Males. **4**: 485 (1953).

Batatas crassicaulis Bentham, Voy. Sulph. 134 (1844).

Ipomoea fistulosa Mart. ex Choisy in DC., Prodr. **9**: 349 (1845).

Biratnagar, cult., 200 m (Oct. 14, 1963, fl.).

Distr. Native of tropical America, in tropical Asia cultivated.

Ipomoea pes-tigridis L., Sp. Pl. ed. 1, **1**: 162 (1753)-Fl. Brit. Ind. **4**: 204 (1883)-Ooststroom in Blumea **3**: 504 (1940); Fl. Males. **4**: 467 (1953).

Dhara Pani-Dhankuta, 900–1200 m (Oct. 17, 1963).

Distr. Tropical E. Africa and tropical Asia.

Ipomoea purpurea (L.) Roth, Bot. Abh. 27 (1787)-Fl. Brit. Ind. **4**: 200 (1883)-Ooststroom in Blumea **3**: 496 (1940); Fl. Males. **4**: 465 (1953).

Convolvulus purpureus L., Sp. Pl. ed. 2, **1**: 219 (1763).

Pharbitis hispida Choisy in Mém. Soc. Phys. Genève **6**: 438 (1833).

Kathmandu Airport, 1400 m (Oct, 13, 1963); Dhara Pani-Dhankuta, 900–1200 m (Oct. 17, 1963, flower double and red); Dhankuta, 1200 m (Oct. 19, 1963, fl. white or red).

Distr. Native of tropical and subtropical America, naturalized in Asia.

Ipomoea Quamoclit L., Sp. Pl. ed. 1, **1**: 159 (1753)-Bot. Mag. t. 244 (1794)-Fl. Brit. Ind. **4**: 199 (1883)-Ooststroom in Blumea **3**: 555 (1940).

Convolvulus pennatus Desr. in Lamarck, Encycl. Méth. **3**: 567 (1791).

Quamoclit vulgaris Choisy in Mém. Soc. Phys. Genève **6**: 434 (1833).

Illam-Ranga Pani, 1200–700 m (Oct. 8, 1963); Dhara Pani-Dhankuta, 900–1200 m (Oct. 17, 1963).

Distr. Circumtropical regions.

Merremia emarginata (Burm. f.) Hallier f. in Engl., Bot. Jahrb. **16**: 552 (1893)-Ooststroom in Blumea **3**: 312 (1939).

Evolvulus emarginatus Burm. f., Fl. Ind. 77 t. 30 (1768).

Ipomoea reniformis Choisy in Mém. Soc. Phys. Genève **6**: 446 (1833); in DC., Prodr. **9**: 351 (1846)-Fl. Brit. Ind. **4**: 206 (1883).

Kathgara-Rangali, 200 m (Dec. 14, 1963).

Distr. Throughout in tropical Africa, and Asia.

Merremia hederacea (Burm. f.) Hallier f. in Engl., Bot. Jahrb. **18**: 118 (1894)-Ooststroom in Blumea **3**: 302 f. 1, e-f, m-n (1939).

Evolvulus hederaceus Burm. f., Fl. Ind. 77, t. 30, f. 2 (1768).

Ipomoea chrysoides Ker-Gawl. in Bot. Reg. t. 270 (1818)-Fl. Brit. Ind. **4**: 206 (1883).

Biratnagar, 200 m (Oct. 15, 1963); Kathgara-Rangali, 200 m (Dec. 14, 1963).

Distr. Throughout in tropical Africa, and Asia.

Porana grandiflora Wall. in Roxburgh, Fl. Ind. ed. Carey, **2**: 41 (1824)-Choisy in DC., Prodr. **9**: 436 (1845)-Kurz in Journ. Bot. **1873**: 138 (1873)-Fl. Brit. Ind. **4**: 221 (1883).

Yektin-Akasay, 1400–2300 m (Nov. 30, 1963, fr.).

Distr. E. Himalaya (Nepal, Sikkim).

Porana paniculata Roxb., Pl. Corom. **3**: 31, t. 235 (1819)-Choisy in DC. Prodr. **9**: 436 (1845)-Kurz in Journ. Bot. **1873**: 137 (1873)-Clarke in Fl. Brit. Ind. **4**: 222 (1883)-Ooststroom, l.c. 93 (1938); Fl. Males. **4**: 404 (1953).

Dumhan-Taplejung, 700–2000 m (Nov. 1, 1963, fl.); Khebang-Bharomdin, 1700–1000 m (Nov. 24, 1963, fl. white); Ranga Pani-Ghorwa, 700–300 m (Dec. 9, 1963, fl.).

Distr. Himalaya, N. India, and Burma, cultivated in the tropics.

Porana racemosa Roxb., Fl. Ind. ed. Carey, **2**: 41 (1824)–Wight, Icon. t. 1376 (1850)–Kurz in Journ. Bot. **1873**: 137 (1873)–Fl. Brit. Ind. **4**: 222 (1883)–Ooststroom in Blumea **3**: 91 (1938); Fl. Males. **4**: 403 (1953).

Swayambhu Nath, Kathmandu, 1500 m (Sep. 21, 1963, fl.); Phusri–Dhara Pani, 450–900 m (Oct. 16, 1963, fl.); Garhi Danra–Tuwa, 2200–1800 m (Nov. 4, 1963, young fr.); Tuwa–Taplethok, 1800–1300 m (Nov. 5, 1963, fr.); Bharomdin–Tharpu, 1000–1200 m (Nov. 25, 1963, fr.); Tharpu–Khunga, 1200–2000 m (Nov. 27, 1963, fr.).

Distr. Throughout in south-eastern tropical Asia.

Porana stenoloba Kurz in Journ. Bot. **1873**: 136 (1873)–Fl. Brit. Ind. **4**: 221 (1883).

Tharpu–Chyangthaphu, 1200–1300 m (Nov. 26, 1963, fr.).

Distr. E. Himalaya (Nepal, Sikkim).

BORAGINACEAE (by Hiroshi Hara)

Cynoglossum glochidiatum Wallich ex Bentham in Royle, Ill. Bot. Himal. 306 (1836)–Fl. Brit. Ind. **4**: 156 (1883)–Brand in Pfl.-reich IV–252, Ht. **78**: 133 (1921).

C. Wallichii G. Don, Gen. Hist. **4**: 354 (1838)–Fl. Brit. Ind. **4**: 157 (1883).

C. denticulatum DC., Prodr. **10**: 150 (1846)–Fl. Brit. Ind. **4**: 157 (1883).

Sanguri Bhanjang, 1200 m (Oct. 16, 1963, fl. & fr.); Khebang–Bharomdin, 1700–1000 m (Nov. 24, 1963, fl.); Zalipur below Gangtok, 1000 m (Sep. 12, 1964, fl.).

Distr. Afghanistan, Turkestan, India, Tibet, east to Assam, and W. China.

The species seems to be related to *C. asperrimum* Nakai of Japan.

Cynoglossum lanceolatum Forskal, Fl. Aegyp.-Arab. 41 (1775)–Brand, l.c. 137 (1921).

C. micranthum Desfontaines, Tab. École. Bot. ed. 1, 220 (1804)–Fl. Brit. Ind. **4**: 156 (1883).

Gangtok, 1600 m (Jun. 13 & 17, 1960, fl., fr.); Rangpo–Tista, 350 m (Jun. 18, 1960, fl., fr.); Tista, 300 m (Jun. 20, 1960, fl., fr.); Godavari near Kathmandu, 1500 m (Sep. 18, 1963, fl.); Gokarna Forest, 1400 m (Sep. 22, 1963, fl.); Murhay, 2100 m (Oct. 22, 1963, fl., fr.); Sinduwa, 2100 m (Oct. 24, 1963, fl., fr.); Dhankuta, 1200 m (Oct. 19, 1963, fl., fr.); Chyangthaphu, 1300 m (Nov. 27, 1963, fl., fr.); Gauriganja, 200m (Dec. 13, 1963, fl.); Rangali–Biratnagar, 200 m (Dec. 15, 1963, fr.).

Distr. Africa, Arabia, Afghanistan, India, Burma, Thai, Indo-China, Malaysia, and China.

In our collections, the ripe nutlets are 1.8–2.2 mm long. *C. formosanum* Nakai from Formosa and south Japan coincides with this species except for larger seeds 3 mm long, and is better treated as a geographical variety of the latter.1)

Cynoglossum zeylanicum Thunberg ex Lehmann in Neue Schr. Nat. Ges. Halle **3** (2): 20 (1817)–Brand, l.c. 134 (1921)–Hara, Enum. Sperm. Jap. **1**: 172 (1949).

C. furcatum Wallich ex Roxburgh, Fl. Ind. ed. Carey, **2**: 6 (1824)–Fl. Brit. Ind. **4**: 155 (1883).

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1) *C. lanceolatum* var. **formosanum** (Nakai) Hara, stat. nov.

C. formosanum Nakai in Bot. Mag. Tokyo **37**: 4 & (69) (1923)–Hara in Journ. Jap. Bot. **18**: 464 (1942); Enum. Sperm. Jap. **1**: 172 (1949).

Rimbick, 1600 m (May 5, 1960); Dentam–Pamianchi, 1500–2000 m (May 12, 1960, no. 212); Lagyap, 2200 m (Sep. 13, 1964); Godavari, Kathmandu, 1500 m (Sep. 18, 1963); Sunderijal, 1600 m (Sep. 20, 1963); Gokarna (Sep. 22, 1963); Murhay, 2100 m (Oct. 22, 1963); Hilay (Oct. 23, 1963); Sinduwa, 2100 m (Oct. 23, 1963); Hati Sar–Minchin Dhap, 2700–2900 m (Oct. 28, 1963); Baroya Khimty–Thakma Khola, 2500–3200 m (Nov. 12, 1963); Thakma Khola–Yamphodin (Nov. 17, 1963); Ghatte–Khebang, 1600–2400 m (Nov. 19, 1963); Khebang, 1700 m (Nov. 23, 1963); Khebang–Bharomdin, 1700–1000 m (Nov. 24, 1963); Halhale Bhanjang, 2700 m (Dec. 1, 1963).

Distr. Afghanistan, Himalaya, India, Ceylon, Indo-China, Malaysia, New Guinea, China, Formosa,, and Japan.

The Himalayan specimens agree well with those from southern Japan.

Hackelia uncinata (Royle ex Benth.) C. E. C. Fischer in Kew Bull. **1939**: 336 (1939).

Cynoglossum uncinatum Royle ex Bentham in Royle, Ill. Bot. Himal. 305 (1836).

Paracaryum glochidiatum Benth. et Hook. f., Gen. Pl. **2**: 850 (1876)–Fl. Brit. Ind. **4**: 161 (1883).

Hackelia glochidiata (Royle) Brand in Pfl.-reich IV–252, Ht. **97**: 119 (1931).

var. **brachytuba** (Diels) Hara, comb. nov.

Paracaryum brachytubum Diels in Not. Bot. Gard. Edinb. **5**: 168 (1912).

Lappula Dielsii Brand in Fedde, Rep. **14**: 147 (1915).

Hackelia Dielsii (Brand) Johnston in Contr. Gray Herb. **68**: 45 (1923)–Brand, l.c. (1931).

H. brachytuba (Diels) Johnston in Journ. Arn. Arb. **18**: 25 (1937); **37**: 304 (1956).

Near Chia Bhanjang, 3200 m (Jun. 2, 1960, no. 744, fl.); Phalut, 3500 m (Jun. 3, 1960, no. 643, fl.); Garibans–Tonglu, 2800–3000 m (Jun. 7, 1960, fl.); Sandakphu, 3600 m (Sep. 16, 1964, fl. & fr.).

Distr. sp. Himalaya (Kashmir to Sikkim), and W. China (Yunnan).

Johnston (1956) referred the Sikkimese plant to *H. brachytuba.* Our specimens have calyx-lobes glabrescent or with scattered appressed hairs, but have lower leaves often cordate at the base, and loose infructescences.

Maharanga Emodi (Wall.) DC., Prodr. **10**: 71 (1846)–Johnston in Journ. Arn. Arb. **35**: 78 (1954).

Onosma Emodi Wallich in Roxb., Fl. Ind. ed. Carey, **2**: 11 (1824)–Fl. Brit. Ind. **4**: 179 (1883)–Johnston in Journ. Arn. Arb. **32**: 361 (1951).

Phalut–Sandakphu, 3300 m (Jun. 6, 1960, fl.); Thakma Khola, 3200 m (Nov. 13, 14 & 16, 1963, fr.); Sandakphu–Kala Pokhari, 3300 m (Sep. 17, 1964, fr.).

Dist. Himalaya (Garhwal to Bhutan), and S. Tibet.

Microula pustulata (Clarke) Duthie in Kew Bull. **1912**: 39 (1912)–Johnston in Contr. Gray Herb. **73**: 62 (1924)–Hand.-Mzt., Symb. Sin. **7**: 821 (1936).

Eritrichium pustulosum C. B. Clarke in Fl. Brit. Ind. **4**: 164 (1883)–Brand in Pfl.-reich IV–252, Ht. **97**: 187, f. 18 (1931).

Garibans–Tonglu, 2800 m (Jun. 7, 1960, fl.).

Distr. Himalaya (Kumaon to Sikkim), S. Tibet, and W. China.

Tournefortia Hookeri C. B. Clarke in Fl. Brit. Ind. **4**: 147 (1883)–Johnston in Journ. Arn. Arb. **16**: 151 (1935).

Rayang, 250 m (Apr. 20, 1960, fl.).

Distr. Subtropical E. Himalaya (Sikkim).

Trigonotis microcarpa (Wall.) Bentham ex C. B. Clarke in Fl. Brit. Ind. **4**: 172 (1883)-Johnston in Journ. Arn. Arb. **18**: 7 (1937).

Eritrichium microcarpum (Wall.) DC., Prodr. **10**: 123 (1846).

T. peduncularis var. *microcarpa* (Wall.) Brand, l.c. 198 (1931).

Godavari, near Kathmandu, 1500 m (Sep. 18, 1963, fl. & fr.).

Distr. E. Himalaya (Nepal, Sikkim), and W. China.

Trigonotis ovalifolia (Wall.) Bentham in Gen. Pl. **2**: 858 (1876)-Fl. Brit. Ind. **4**: 172 (1883).

Myosotis ovalifolia Wall. in Roxburgh, Fl. Ind. ed. Carey, **2**: 9 (1824).

Chia Bhanjang-Phalut, 3200 m (Jun. 2, 1960, no. 625, fl.).

Distr. E. Himalaya (Nepal, Sikkim).

VERBENACEAE (by Takasi Yamazaki)

Callicarpa arborea Roxb. [Hort. Beng. 10 (1814), nom. nud.] ex C. B. Clarke in Hooker f., Fl. Brit. Ind. **4**: 567 (1885).

Rayang, 250 m (Apr. 21, 1960); Siliguri–Kurseong, 1100–1200 m (Apr. 29, 1960); Pamianchi–Tingling Bridge, 1000–2000 m (May 15, 1960); Dhara Pani–Dhankuta, 900–1200 m (Oct. 17, 1963); Dumhan–Taplejung (Oct. 31, 1963); Tuwa–Taplethok, 1800–1300 m (Nov. 5, 1963).

Distr. Himalaya (Kumaon to Assam), Burma, Malaya, Indo-China, and S. China.

Callicarpa macrophylla Vahl, Symb. Bot. **3**: 13, t. 53 (1794)-Fl. Brit. Ind. **4**: 568 (1885).

Gokarna, northeast of Kathmandu, 1500 m (Sep. 22, 1963); Phusri–Dhara Pani, 450–900 m (Oct. 16, 1963); Dhankuta, 1200 m (Oct. 19, 1963); Ranga Pani–Ghorwa, 400–300 m (Dec. 9, 1963).

Distr. Himalaya (Kashmir to Assam), Bengal, Burma, Indo-China, and S. China.

Callicarpa vestita Wall. ex C. B. Clarke in Hooker f., Fl. Brit. Ind. **4**: 567 (1885).

Tista, 400 m (Jun. 20, 1960); Dhankuta, 1200 m (Oct. 21, 1963); Ranga Pani–Ghorwa, 400–300 m (Dec. 9, 1963); Sibganja–Mahara Bahara, 200 m (Dec. 12, 1963).

Distr. E. Himalaya (Nepal, Sikkim).

Clerodendrum canescens Wall. ex Schauer in DC., Prodr. **11**: 665 (1847)-Fl. Brit. Ind. **4**: 589 (1885), in nota.

Gangtok–Rangpo, 600 m (Jun. 28, 1960, fl. white).

Distr. Indo-China, S. China, and Formosa; naturalized in India.

Clerodendrum Colebrookianum Walp., Rep. **4**: 114 (1846), ut *Colebrokianum*-Fl. Brit. Ind. **4**: 594 (1885).

Mul Pokhari–Dumhan, 1500–700 m (Oct. 30, 1963); Dumhan, by the Tamur River, 700 m (Oct. 31, 1963); Taplethok–Helok, 1300–1500 m (Nov. 6, 1963); Bharomdin–Tharpu, 1000–1200 m (Nov. 25, 1963).

Distr. Himalaya, N. India, Burma, Indo-China, and W. China (Yunnan).

Clerodendrum divaricatum Jack, Mal. Misc. **1**: 48 (1820)-Merrill in Journ.

Arn. Arb. **33**: 219 (1952).

C. serratum Sprengel, Syst. Veg. **2**: 758 (1825)–Fl. Brit. Ind. **4**: 592 (1885).

Siliguri-Kurseong, 300 m (Apr. 29, 1960); Kathgara–Rangali, 200 m (Dec. 14, 1963).

Distr. Madagascar, Himalaya, India, Indo-China, and Malaysia.

Clerodendrum fragrans Ventenat, Jard. Malm. t. 70 (1803)–Fl. Brit. Ind. **4**: 589 (1885), in nota.

f. **pleniflorum** Schauer in DC., Prodr. **11**: 666 (1847).

Dhankuta in *Pinus* forest, 1200 m (Oct. 19, 1963, fl. white); Dumhan, 700 m (Oct. 31, 1963, fl. pale rosaceous, fragrant); Sibganja–Mahara Bahara, 200 m (Dec. 12, 1963).

Distr. sp. Malaya, Indo-China, and S. China; naturalized in India.

Clerodendrum indicum (L.) O. Kuntze, Rev. Gen. Pl. 506 (1891).

Siphonanthus indica L., Sp. Pl. ed. 1, 109 (1753).

C. siphonanthus R. Brown in Aiton, Hort. Kew. ed. 2, **4**: 65 (1812).

Rangali–Biratnagar, 200 m (Dec. 15, 1963).

Distr. Himalaya, India, Burma, Malaya, Indo-China, and S. China.

Clerodendrum infortunatum L., Sp. Pl. ed. 1, 637 (1753)–Fl. Brit. Ind. **4**: 594 (1885).

C. viscosum Ventenat, Jard. Malm. t. 25 (1803)–Bot. Mag. t. 1805 (1816)–Santapau in Bull. Bot. Surv. India **3**: 14 (1961).

Rayang, 250 m (Apr. 21, 1960); Dhara Pani–Illam, 1500–1200 m (Dec. 5, 1963).

Distr. Himalaya, India, Ceylon, Malaya, Indo-China, and S. China.

Clerodendrum japonicum (Thunb.) Sweet, Hort. Brit. 322 (1827)–Rehder in Pl. Wilson. **3**: 377 (1916)–Hara, Enum. Sperm. Jap. **1**: 187 (1949).

Volkameria japonica Thunberg in Nov. Act. Reg. Soc. Sci. Upsal. **3**: 208 (1780).

C. squamatum Vahl, Symb. **2**: 74 (1791)–Fl. Brit. Ind. **4**: 593 (1885).

Tista–Rangpo, 350 m (Jun. 13, 1960); Gangtok, 1650 m (Jun. 13, 1960); Phusri–Dhara Pani, 450–900 m (Oct. 16, 1963); Dhara Pani–Dhankuta, 900–1200 m (Oct. 17, 1963).

Distr. A native of tropical Asia, widely cultivated.

Clerodendrum Wallichii Merrill in Journ. Arn. Arb. **33**: 220 (1952).

C. nutans (non Jack) Wall. ex D. Don, Prodr. Fl. Nepal. 103 (1825)–Fl. Brit. Ind. **4**: 591 (1885).

Phusri–Dhara Pani, 450–900 m (Oct. 16, 1963).

Distr. Himalaya, India, Burma, and Indo-China.

Duranta repens L., Sp. Pl. ed. 1, 637 (1753)–Meeuse in Blumea **5**: 70 (1942)

Duranta Plumieri Jacquin, Select. Strip. Amer. 186 (1763)–Schauer in DC., Prodr. **11**: 615 (1847)–Haines, Bot. Bihar Orissa **4**: 709 (1922).

Gangtok, 1650 m (Apr. 26, 1960); Gangtok–Saramsa Medicinal Garden, 1650–1000 m (Jun. 17, 1960); Biratnagar, 200 m (Oct. 14, 1963); Illam, 1200 m (Dec. 6, 1963, drupe orange).

Distr. A native of Central America; naturalized in India.

Holmskioldia sanguinea Retz., Obs. Bot. **6**: 31 (1791)–Fl. Brit. Ind. **4**: 596 (1885).

Tharpu-Chyangthaphu, 1200–2700 m (Nov. 26, 1963); Phusri–Dhara Pani, 450–900 m (Oct. 16, 1963); Khebang–Bharomdin, 1700–1000 m (Nov. 24, 1963); Dhara

Pani–Illam (Dec. 5, 1963); Illam–Ranga Pani, 1200–700 m (Dec. 8, 1963); Ranga Pani–Ghorwa, 700–300 m (Dec. 9, 1963).

Distr. Subtropical Himalaya (Kumaon to Bhutan).

Lantana Camara L., Sp. Pl. ed. 1, 627 (1753)–Fl. Brit. Ind. **4**: 565 (1885).

Mul Pokhari–Dumhan, 2400–700 m (Oct. 30, 1963, fl.); Khebang–Bharomdin, 1700–1000 m (Nov. 24, 1963, fr.); Dhara Pani–Illam, 1500–1200 m (Dec. 5, 1963, fr.); Illam, 1200 m (Dec. 6, 1963).

Distr. A native of tropical America, introduced pantropic.

Premna barbata Wall. ex Schauer in DC., Prodr. **11**: 636 (1847)–Fl. Brit. Ind. **4**: 579 (1885).

Pamianchi–Tingling Bridge, 1000–2000 m (May 11, 1960, fr. blue-black); Dentam–Pamianchi (May 12, 1960).

Distr. Subtropical Himalaya (Kumaon to Bhutan).

var. **anodon** C. B. Clarke in Hooker f., Fl. Brit. Ind. **4**: 579 (1885).

Naya Bazar–Namchi, 1200 m (Mar. 27, 1963); Singtam–Gangtok, 700 m (Mar. 29, 1963).

Distr. var. E. Himalaya (Sikkim, Bhutan).

Premna interrupta Wall. ex Schauer in DC., Prodr. **11**: 633 (1847)–Fl. Brit. Ind. **4**: 572 (1885)–Osmaston, For. Fl. Kumaon 410 (1927).

Yoksam–Bakkim, 1700–2500 m (May 18, 1960, fl.).

Distr. Himalaya (Kumaon to Sikkim).

Premna latifolia Roxb. var. **mucronata** (Roxb.) C. B. Clarke in Hooker f., Fl. Brit. Ind. **4**: 578 (1885)–Haines, Bot. Bihar Orissa **4**: 717 (1922).

P. mucronata Roxb., Fl. Ind. ed. 2, **3**: 635 (1832).

Sibganja–Gauriganja, 200 m (Dec. 12, 1963, fr.).

Distr. Himalaya (Kumaon to Bhutan).

Tectona grandis L. f., Suppl. Pl. 151 (1781)–Fl. Brit. Ind. **4**: 570 (1885).

Rayang, cult., 250 m (Apr. 22, 1960).

Distr. India, Malaya, Burma, Indo-China, Sumatra, and Java.

Verbena officinalis L., Sp. Pl. ed. 1, 20 (1753)–Fl. Brit. Ind. **4**: 565 (1885).

V. sororia D. Don, Prodr. Fl. Nepal. 104 (1825).

Helok–Iladanda, 1500–1800 m (Nov. 8, 1963, fl.).

Distr. Cosmopolitan in tropical and subtropical regions.

Vitex Negundo L., Sp. Pl. ed. 1, 638 (1753)–Fl. Brit. Ind. **4**: 583 (1885).

Tista–Kalimpong, 1300 m (Jun. 20, 1960); Dumhan–Taplejung, 700–2000 m (Nov. 1, 1963); Khebang–Bharomdin, 1700–1000 m (Nov. 24, 1963).

Distr. Afghanistan, Himalaya, India, Burma, Indo-China, and Malaya.

Vitex peduncularis Wall. ex Schauer in DC., Prodr. **11**: 687 (1847)–Fl. Brit. Ind. **4**: 587 (1885).

Ghorwa–Sanichare, 200 m (Dec. 10, 1963).

Distr. E. Himalaya, Burma, Indo-China, and Malaya.

LABIATAE (by Gen Murata)

Achyrospermum Wallichianum (Benth.) Bentham ex Hook. f., Fl. Brit. Ind. **4**: 673 (1885)–Mukerjee, Lab. Ind. 154 (1940).

Teucrium Wallichianum Benth. in Wallich, Pl. Asia. Rar. **2**: 19 (1831); Lab.

Gen. Sp. 671 (1835).

Gangtok–Saramsa Medicinal Garden, 800 m (Jun. 17, 1960); Sanguri Bhanjang–Dhara Pani, 1000 m (Oct. 16, 1963, fl.); Illam–Ranga Pani, 500 m (Dec. 8, 1963); Zalipur, 1000 m (Sep. 12, 1964).

Distr. E. Himalaya (Nepal to Bhutan), Assam, and N. Burma.

Acrocephalus indicus (Burm.) O. Kuntze, Rev. Gen. Pl. **2**: 512 (1891)–Kudo, Lab. Sino-Jap. 109 (1929)–Mukerjee, l.c. 29 (1940).

Prunella indica Burm. f., Fl. Ind. 130 (1763).

Ocimum capitellatum L. f., Suppl. Pl. 276 (1781).

Ocimum capitatum Roth, Nov. Pl. Sp. 276 (1821).

Lumnitzera capitata Spr., Syst. Veg. **2**: 687 (1825).

A. capitatus (Roth) Benth., l.c. 18 (1831)–Fl. Brit. Ind. **4**: 611 (1885)–Forb. et Hemsl. Ind. Fl. Sin. **2**: 269 (1890)–Hook., Icon. Pl. **1**: t. 456 (1892)–Dunn in Not. Bot. Gard. Edinb. **28**: 134 (1915).

A. Blumei Benth., Lab. Gen. Sp. 23 (1832).

Tamur Bridge–Dhankuta, 1000 m (Oct. 17, 1963, fr.); Sibganja–Gauriganja, 200 m (Dec. 12, 1963, fr.).

Distr. Himalaya, India, Malaya, and China.

Ajuga lobata D. Don, Prodr. Fl. Nepal. 108 (1825)–Fl. Brit. Ind. **4**: 702 (1885)–Hand.-Mzt., Symb. Sin. **7**: 912 (1936)–Mukerjee, Lab. Ind. 224 (1940).

Rimbick–Ramam, 1900–2400 m (May 7, 1960, no. 125); Ramam–Phalut, 2400 m (May 9, 1960); Phalut–Chia Bhanjang, 3300 m (May 11, 1960, no. 197); Bakkim–Jongri, 2500–4000 m (May 19, 1960); Sandakphu–Garibans, 3500–2800 m (Jun. 7, 1960, no. 701); Sinduwa–Bilbatay Bhanjang, 2300 m (Oct. 24, 1963); Hati Sar–Lam Pokhari (Oct. 28, 1963); Batasay–Halhale Bhanjang, 2500 m (Dec. 1, 1963).

Distr. E. Himalaya (Nepal to Bhutan), Assam, N. Burma, and China.

Ajuga macrosperma Wallich var. **breviflora** Hooker f., Fl. Brit. Ind. **4**: 704 (1885)–Mukerjee, l.c. 226 (1940).

Takdah, 1900 m (Apr. 19, 1960, no. 2159); Kalimpong, 1300 m (Apr. 23, & Jun. 19, 1960); Mani Bhanjang–Batasi, 2000–2100 m (May 1, 1960, no. 15); Pamianchi–Gayzing Bazar, 1550 m (May 13, 1960); Pamianchi–Ratong Chu, 1000 m (May 15, 1960); Gangtok, 1600 m (Jun. 13, 1960); Gangtok–Saramsa Medicinal Garden, 800 m (Jun. 17, 1960); Dumhan–Thaplejung, 1500 m (Nov. 1, 1963); Taplejung–Garhi Danra, 2000–2200 m (Nov. 3, 1963); Khebang, 1400 m (Nov. 23, 1963); Khebang–Bharomdin 1700–1000 m (Nov. 24, 1963); Bharomdim–Tharpu 1000–1200 m (Nov. 25, 1963); Chyangthaphu–Birwa, 1100–2400 m (Nov. 27, 1963).

Distr. var. E. Himalaya (E. Nepal, Sikkim), and Khasia.

The corollae are bluish white.

var. **Thomsonii** Hook. f., Fl. Brit. Ind. **4**: 704 (1885)–Mukerjee, l.c. 226 (1940).

Pamianchi–Tingling Bridge, 1000–2000 m (May 15, 1960); Dhara Pani–Illam, 1400 m (Dec. 5, 1963); Illam–Ranga Pani, 400 m (Dec. 8, 1963).

Distr. var. E. Himalaya (Nepal, Sikkim).

The corollae of this variety are blue purple.

Anisochilus carnosus Wallich, Pl. Asia. Rar. **2**: 18 (1831)–Wight, Ill. **2**: t. 176 b, 1 (1850)–Fl. Brit. Ind. **4**: 627 (1885)–Mukerjee, Lab. Ind. 58 (1940).

Tamur Bridge–Dhankuta, 400–1000 m (Oct. 17, 1963).

Distr. Himalaya, India, and Burma.

Anisochilus pallidus Wallich, Pl. Asia. Rar. **2**: 18 (1831)–Fl. Brit. Ind. **4**: 629 (1885)–Kudo, Lab. Sino-Jap. 141 (1929)–Doan in Fl. Gén. Indo-Chin. **4**: 924 (1936)–Mukerjee, l.c. 57 (1940).

Phusri–Sanguri Bhanjang, 900 m (Oct. 16, 1963); Nissim–Dumhan, 900 m (Oct. 30, 1963); Mul Pokhari–Dumhan, 2000 m (Oct. 30, 1963); Tuwa–Taplethok, 1800–1300 m (Nov. 5, 1963); Siling Tzokupa–Khebang, 2100–1700 m (Nov. 22, 1963); Khebang–Bharomdin, 1500 m (Nov. 24, 1963); Bharomdin–Tharpu, 1000 m (Nov. 25, 1963); Tharpu, 1200 m (Nov. 26, 1963); Chyangthaphu–Birwa, 1100–2400 m (Nov. 27, 1963).

Distr. E. Himalaya (Nepal to Assam), Indo-China, and W. China (Yunnan).

Anisomeles indica O. Kuntze, Rev. Gen. Pl. 512 (1891)–Mukerjee, l.c. 152 (1940)–Kitam. et Murata in Faun. & Fl. Nepal Himal. **1**: 209 (1955).

Chovar Gorge, south of Kathmandu (Sep. 21, 1963); Biratnagar, 200 m (Oct. 14, 1963); Sanguri Bhanjang–Dhara Pani, 450–1200 m (Oct. 16, 1963); Dhankuta, 1200 m (Oct. 19, 1963); Tuwa–Taplethok, 1200 m (Nov. 5, 1963); Siling Tzokupa–Khebang, 2100–1700 m (Nov. 22, 1963); Illam–Ranga Pani, 1200–700 m (Dec. 8, 1963); Chisa Pani–Ghorwa, 700–300 m (Dec. 9, 1963); Sibganja–Mahara Bahara, 200 m (Dec. 12, 1963).

Distr. Himalaya, India, Ceylon, Malaysia, S. China, Formosa, and Ryukyu.

Clinopodium umbrosum (M.-B.) C. Koch in Linnaea **21**: 673 (1848)–Boriss in Fl. URSS. **21**: 439 (1954)–Murata in Kitamura, Fl. Afghan. 328 (1960).

Melissa umbrosa M.-Bieb., Fl. Taur. Cauc. **2**: 63 (1808).

Calamintha umbrosa Fisch. et Mey., Ind. Sem. Hort. Petrop. **6**: 6 (1840)–Fl. Brit. Ind. **4**: 650 (1885)–Mukerjee, Lab. Ind. 98 (1940).

Tendong Peak, 2700 m (Mar. 26, 1963); Victoria Fall, Darjeeling, 1900 m (Apr. 2, 1960); Godavari, 1500 m (Sep. 18, 1963); Gokarna Forest, 1500 m (Sep. 22. 1963); Pouwa, 1600 m (Oct. 9, 1963); Kathmandu Airport (Oct. 13, 1963); Dhankuta–Hilay, 1200–1800 m (Oct. 23, 1963); Murhay, 2000 m (Oct. 23, 1963); Sinduwa, 2100 m (Oct. 23, 1963); Minchin Dhap–Mul Pokhari, 2600 m (Oct. 29, 1963); Helok, 1500 m (Nov. 7, 1963); Iladanda–Selap, 2000 m (Nov. 9, 1963); Lelep, 2600 m (Nov. 9, 1963); Baroya Khimty–Thakma Khola, 2500–3100 m (Nov. 12, 1963); Chyangthaphu–Birwa, 1500 m (Nov. 27, 1963); Birwa–Yektin (Nov. 28, 1963); Batasay–Bhuspate Danra, 2400–2900 m (Dec. 1, 1963); Mai Majuwa–Dhara Pani (Dec. 4, 1963).

Distr. Caucasus, Iran, Afghanistan, Himalaya (Nepal to Bhutan), Assam, and Burma.

Colebrookia oppositifolia Smith, Exot. Bot. **2**: t. 3 (1805)–Fl. Brit. Ind. **4**: 642 (1885)–Doan in Fl. Gén. Indo-Chin. **4**: 962, f. 101. 6–10 (1936)–Mukerjee, l.c. 84 (1940).

Kalimpong, 1300 m (Apr. 24, 1960); above Tista Bazar, 500 m (May 17, 1963); Phusuri–Dhara Pani (Oct. 16, 1963); Garhi Danra–Linkhim, 1500 m (Nov. 4, 1963); Tuwa–Taplethok, 1800–1300 m (Nov. 5, 1963); Siling Tzokupa–Khebang, 1500 m (Nov. 22, 1963); Khebang–Bharomdin, 1700–1000 m (Nov. 24, 1963); Tharpu–Chyangthaphu, 1000 m (Nov. 26, 1963); Tharpu, 1200 m (Nov. 26, 1963); Chyangthaphu–Birwa, 1600 m (Nov. 27, 1963); Dhara Pani–Illam, 1000 m (Dec. 5, 1963); Ranga Pani–Chisa Pani, 600 m (Dec. 9, 1963).

Distr. Himalaya, India, Burma, Indo-China, and W. China (Yunnan).

The flowers white, common in subtropical Himalaya.

Coleus Forskohlii (Willd.) Briq. in Engl., Pfl.-fam. IV, **3a**: 359 (1897)-Mukerjee, Lab. Ind. 53 (1940).

Plectranthus Forskolaei Willd., Sp. Pl. **3**: 169 (1800)-Bot. Mag. t. 2036 (1819).

P. barbatus Andr., Bot. Rep. t. 594 (1809).

Coleus barbatus Benth. in Wallich, Pl. Asia. Rar. **2**: 15 (1831)-Wight, Icon. 1432 (1849)-Fl. Brit. Ind. **4**: 625 (1885).

Khebang-Bharomdin, 1300 m (Nov. 24, 1963); Birwa-Yektin, 1600 m (Nov. 28, 1963).

Distr. Tropical Africa, E. Himalaya (Nepal), India, and Ceylon.

Colquhounia coccinea Wallich in Trans. Linn. Soc. **13**: 608 (1822)-Bot. Mag. t. 4514 (1850)-Fl. Brit. Ind. **4**: 674 (1885)-Hand.-Mzt., Symb. Sin. **7**: 926 (1936)-Mukerjee, Lab. Ind. 155 (1940)-Kitam. et Murata, Faun. & Fl. Nepal Himal. **1**: 210 (1955).

Sanguri Bhanjang-Dhara Pani, 1100 m (Oct. 16, 1963); Bilbatay Bhanjang, 2200 m (Oct. 26, 1963); Baroya Khimty-Thakma Khola, 2500-3100 m (Nov. 12, 1963); Birwa-Yektin, 1500 m (Nov. 28, 1963); Yektin-Akasay, 1500 m (Nov. 30, 1963); Bhuspate Danra, 2600 m (Dec. 2, 1963); Mai Pokhari-Dhara Pani, 1500 m (Dec. 4, 1963); Dhara Pani-Illam, 1400 m (Dec. 5, 1963).

Distr. Himalaya (Kumaon to Bhutan), and W. China (Yunnan, Szechuan).

Craniotome versicolor Reichb., Icon. Exot. **1**: 39 (1824)-Benth. in Wall., Pl. Asia. Rar. **1**: 64 (1830)-Fl. Brit. Ind. **4**: 672 (1885)-Kudo, Lab. Sino-Jap. 182 (1929)-Mukerjee, Lab. Ind. 151 (1940)-Kitam. et Murata, l.c. 211 (1955).

Kurseong (Apr. 2, 1960); Darjeeling, 2000 m (Apr. 4, 1960 & Dec. 26, 1963); Batasi, 2000 m (May 2, 1960); Sunderijal Waterfall, near Kathmandu, 1600 m (Sep. 20, 1963); Swayambu Nath, Kathmandu, 1500 m (Sep. 23, 1963); Sanguri Bhanjang-Dhara Pani, 1000 m (Oct. 16, 1963); Dhankuta-Hilay, 1200-1800 m (Oct. 23, 1963); Taplejung, 1700 m (Nov. 2, 1963); Taplethok-Helok, 1300-1500 m (Nov. 6, 1963); Helok-Iladanda, 1700 m (Nov. 8, 1963); Mai Majuwa-Dhara Pani, 1600-1500 m (Dec. 4, 1963).

Distr. Himalaya N. India, N. Burma, Indo-China, and W. China (Yunnan).

Elsholtzia blanda Bentham, Lab. Gen. Sp. 162 (1833)-Fl. Brit. Ind. **4**: 643 (1885)-Mukerjee, Lab. Ind. 89 (1940).

Gangtok, 1600 m (Jun. 13, 1960); Godavari, 1500 m (Sep. 18, 1963); Powna, Kathmandu, 1600 m (Oct. 9, 1963); Phusri-Sanguri Bhanjang, 1000 m (Oct. 16, 1963); Dhara Pani-Dhankuta (Oct. 17, 1963); Dhankuta, 1100 m (Oct. 19, 1963); Dhankuta-Hilay, 1700 m (Oct. 23, 1963); Mul Pokhari-Gorzu Kosir, 2400-700 m (Oct. 30, 1963); Dumhan-Taplejung, 1400 m (Nov. 1, 1963); Siling Tzokupa-Khebang, 1700 m (Nov. 22, 1963); Chyangthaphu-Birwa, 1700 m (Nov. 27, 1963); Mai Majuwa-Mai Pokhari, 1800-1600 m (Dec. 4, 1963).

Distr. E. Himalaya (Nepal to Bhutan), Khasia, Burma, and Sumatra.

Elsholtzia ciliata (Thunb.) Hyland. in Bot. Notiser **1941**: 129 (1941).

Sideritis ciliata Thunb., Fl. Jap. 245 (1784).

Mentha Patrini Lepech. in Nov. Act. Acad. Petrop. **1**: 336, t. 8 (1787).

E. Patrini (Lepech.) Garcke, Fl. Halle **2**: 213 (1856)-Hara, Enum. Sperm. Jap. **1**: 203 (1948)-Fl. URSS. **21**: 635 (1954).

E. cristata Willd. in Roemer et Usteri, Mag. Bot. **4–2**: 5, t. 1 (1890)–Doan in Fl. Gén. Indo-Chin. **4**: 977 (1936)–Mukerjee, l.c. 92 (1940).

Sinduwa, 2100 m (Oct. 23, 1963); Helok–Iladanda, 1800 m (Nov. 8, 1963); Ghatte–Khebang, 1600–1700 m (Nov. 19, 1963).

Distr. Europe, Himalaya, N. India, China, Formosa, Korea, Siberia, Manchuria, and Japan.

Elsholtzia flava Bentham, Lab. Gen. Sp. 161 (1833)–Fl. Brit. Ind. **4**: 644 (1885)–Mukerjee, l.c. 88 (1940).

Dhankuta–Murhay (Oct. 22, 1963); Murhay, 2000 m (Oct. 23, 1963); Murhay–Bilbatay Bhanjang, 2000–2200 m (Oct. 24, 1963); Bhandukay Bhanjang–Mai Majuwa, 2500 m (Dec. 3, 1963).

Distr. Himalaya (Kumaon to Nepal), and Assam.

Elsholtzia fruticosa (D. Don) Rehder in Pl. Wilson. **3**: 381 (1916)–Hand.-Mzt., Symb. Sin. **7**: 934 (1936)–Kitamura et Murata in Faun. & Fl. Nepal. Himal. 211 (1955).

Perilla fruticosa D. Don, Prodr. Fl. Nepal. 115 (1825).

Aphanochilus polystachya Benth. in Wall., Pl. Asia. Rar. **1**: 27, t. 33 (1830).

E. polystachya Benth., Lab. Gen. Sp. 161 (1833)–Fl. Brit. Ind. **4**: 643 (1885)–Mukerjee, Lab. Ind. 89 (1940).

E. tristis Lév. et Vant. in Fedde, Rep. **8**: 425 (1910).

E. Dielsii Lév. in Fedde, Rep. **9**: 441 (1911).

E. Souliei Lév. in Fedde, Rep. **9**: 248 (1911).

A. fruticosus (D. Don) Kudo, Lab. Sino-Jap. 61 (1929).

Garibans–Tonglu, 2800 m (Jun. 7, 1960); Dhankuta–Murhay, 1200–2000 m (Oct. 22, 1963); Sinduwa, 2100 m (Oct. 23, 1963); Minchin Dap–Mul Pokhari, 2600 m (Oct. 29, 1963); Mul Pokhari–Nissim, 2000 m (Oct. 30, 1963); Diorali Bhanjang–Yamphodin, 2500 m (Nov. 17, 1963); Mai Majuwa–Mai Pokhari, 1800–1600 m (Dec. 4, 1963).

Distr. Himalaya (Kashmir to Sikkim), Khasia, Tibet, and China (Yunnan, Szechuan, Hupeh, Tschili).

Elsholtzia incisa Bentham, Lab. Gen. Sp. 162 (1833)–Fl. Brit. Ind. **4**: 644 (1885)–Mukerjee, Lab. Ind. 89 (1940).

Dumhan–Taplejung, 1200 m (Nov. 1, 1963); Taplejung–Garhi Danra, 2000–2200 m (Nov. 3, 1963); Tuwa–Taplethok, 1500 m (Nov. 5, 1963); Helok, 1500 m (Nov. 7, 1963); Khebang–Siling Tzokupa, 1700–2100 m (Nov. 20, 1963); Khebang–Bharomdin, 1700–1000 m (Nov. 24, 1963); Bharomdin–Tharpu, 1000–1200 m (Nov. 25, 1963).

Distr. Himalaya (Kashmir, to Mishmi), and N. Burma.

Elsholtzia pilosa Bentham, Lab. Gen. Sp. 163 (1833)–Fl. Brit. Ind. **4**: 644 (1885)–Mukerjee, l.c. 88 (1940).

Dhankuta–Murhay, 1800 m (Oct. 23, 1963); Murhay, 2000 m (Oct. 23, 1963); Dhankuta–Hilay, 1700 m (Oct. 23, 1963); Taplejung–Garhi Danra, 1900 m (Nov. 3, 1963); Iladanda–Selap, 2000 m (Nov. 9, 1963); Iladanda–Helok, 1700 m (Nov. 13, 1963); Mai Majuwa–Mai Pokhari, 1700 m (Dec. 4, 1963).

Distr. Himalaya (Kumaon to Sikkim), and Khasia.

Elsholtzia strobilifera Bentham, Lab. Gen. Sp. 163 (1833)–Fl. Brit. Ind. **4**: 645 (1885)–Mukerijee, l.c. 92 (1940).

Along the Choktsering Chu, north of Jongri, 4000 m (May 25, 1960); Dhankuta–

Murhay, 1200–2000 m (Oct. 22, 1963); Dhankuta-Hilay, 1800 m (Oct. 23, 1963); Murhay, 2000 m (Oct. 23, 1963); Bilbatay Bhanjang-Tinjuray, 2700 m (Oct. 27, 1963); Hati Sar-Lam Pokhari, 2700 m (Oct. 28, 1963); Minchin Dhap–Mul Pokhari, 2800–2400 m (Oct. 29, 1963); Selep–Walunchung Gola, 3000 m (Nov. 10, 1963); Zongi–Iladanda, 2600–1800 m (Nov. 12, 1963); Baroya Khimty–Thakma Khola, 2500–3100 m (Nov. 12, 1963); Birwa–Yektin, 2300 m (Nov. 28, 1963); Yektin–Batasay, 1400–2400 m (Nov. 30, 1963); Bhuspate Danra, 2600 m (Dec. 2, 1963).

Distr. Himalaya (Simla to Sikkim).

Geniosporum coloratum (D. Don) O. Kuntze, Rev. Gen. Pl. **2**: 517 (1891)–Briq. in Engl., Pfl.-fam. IV, **3a**: 367 (1897)–Mukerjee, Lab. Ind. 32 (1940)–Kitam. & Murata, l.c. 211 (1955).

Plectranthus coloratus D. Don, Prodr. Fl. Nepal. 116 (1825).

G. strobiliferum Wallich, Pl. Asia. Rar. **2**: 18 (1831)–Hook., Icon. Pl. **5**: t. 462 (1842)–Fl. Brit. Ind. **4**: 610 (1885)–Dunn in Not. Bot. Gard. Edinb. **28**: 134 (1915)–Kudo, Lab. Sino-Jap. 112 (1929).

Pouwa, Kathmandu (Oct. 9, 1963); Phusri–Sanguri Bhanjang, 1000 m (Oct. 16, 1963); Dhankuta, 1200 m (Oct. 19, 1963); Dumhan–Taplejung, 700–2000m (Nov. 1, 1963); Illam–Jog Mai, 1200–700 m (Dec. 8, 1963).

Distr. Himalaya (Garhwal to Bhutan), Khasia., N. Burma, Indo-China, and W. China (Yunnan).

Gomphostemma melissaefolium (Roxb.) Wall. ex Benth. in Wallich, Pl. Asia. Rar. **2**: 12 (1831)–Fl. Brit. Ind. **4**: 698 (1885)–Mukerjee, Lab. Ind. 213 (1940).

Tharpu–Chyangthaphu, 1200–1100 m (Nov. 26, 1963).

Distr. E. Himalaya (E. Nepal), and N. India (Khasia, Assam, Cachar).

Hyptis suaveolens Poit. in Ann. Mus. Par. **7**: 472, t. 29, f. 2 (1806)–Fl. Brit. Ind. **4**: 630 (1885)–Mukerjee, Lab. Ind. 63 (1940).

Rayang, Darjeeling, 250 m (Apr. 23, 1960); Phusri–Sanguri Bhanjang, 500 m (Oct. 16, 1963); Dhara Pani–Tamur Bridge, 300–1200 m (Oct. 17, 1963); Chisa Pani–Ghorwa, 700–300 m (Dec. 9, 1963).

Distr. Introduced from tropical America.

Isodon Coetsa (Ham.) Kudo, Lab. Sino-Jap. 131 (1929)–Kitamura et Murata in Faun. & Fl. Nepal Himal. **1**: 212 (1955).

Plectranthus Coetsa Ham. ex D. Don, Prodr. Fl. Nepal. 117 (1825)–Fl. Brit. Ind. **4**: 619 (1885)–Mukerjee, Lab. Ind. 44 (1940).

P. menthoides Benth. in Wallich, Pl. Asia. Rar. **2**: 17 (1831)–Fl. Brit. Ind. **4**: 620 (1885).

Dhankuta, 1200 m (Oct. 21, 1963); Dhankuta–Murhay, 1200–2000 m (Oct. 23, 1963); Sinduwa, 2100 m (Oct. 24, 1963); Mul Pokhari–Gorzu Kosir, 2000 m (Oct. 30, 1963); Dumhan–Taplejung, 1400 m (Nov. 1, 1963); Taplejung, 1700 m (Nov. 2, 1963); Taplejung–Garhi Danra, 1900 m (Nov. 3, 1963); Iladanda–Helok, 1800 m (Nov. 13, 1963); Ghatte, 1300 m (Nov. 17, 1963); Ghatte–Khebang, 1600–1700 m (Nov. 19, 1963); Yektin–Batasay, 1400–2400 m (Nov. 30, 1963); Mai Majuwa–Dhara Pani, 1800–1500 m (Dec. 4, 1963); Illam–Ranga Pani, 1200–700 m (Dec. 8, 1963); Ranga Pani–Ghorwa, 700–300 m (Dec. 9, 1963).

Distr. India, Ceylon, N. Burma, and W. China (Yunnan, Szechuan).

Isodon dhankutanus Murata in Act. Phytotax. Geobot. **22**: 21, t. 1 & 2-1 (1966).

Herba perennis. Caulis erectus 90–150 cm altus simplex superme ramosus quadrangularis pilis recurvatis breviusculis obtecti. Folia opposita breviter petiolata; lamina ovato-lanceolata 3–7 cm longa 1–3 cm lata, supra sparsim breviter hirtella, subtus pallidiora minutissime glanduloso-punctata et adpresse puberulo-tomentosa, apice acuminata, margine serrato-dentata, basi ad petiolum cuneato-decurrentia, petiolis 0.5–2 cm longis. Folia floralia conformia gradatim minora. Cimae 5–9 florae paniculato-racemosae, pedunculis gracillimis 5–10 mm longis, pedicelis 2–3 mm longis hirtellis, bracteis minutissimis setaceis. Calyx campanulatus 2–2.5 mm longus extus glanduloso punctatus et minute hirtellus 5-dentatus, dentibus aequalibus 0.5 mm longis deltoideis subacutis, fructifer tubuloso-campanulatus 4–5 mm longus subcurvatus, nervis prominulis. Corlla ca. 5 mm longa puberula calycem superans, tubo angusto, basi supra subgibboso, labio inferiore naviculari 1.2 mm longo, superiore 4-lobulato erecto inferioribus aequilongo. Stamina 4 saepe inclusa. Nuculae 0.9 mm longae 0.5 mm latae late ellipsoideae bruneae laeves.

E. Nepal: Dhankuta, 1200 m (Oct. 18, 1963—Typus in TI).

Dry shady situation in the Pine forest. The flowers are light bluish purple.

Isodon macranthus (Hook. f.) Kudo, Lab. Sino-Jap. 138 (1929).

Plectranthus macranthus Hook. f., Fl. Brit. Ind. **4**: 616 (1885)–Dunn in Not. Bot. Gard. Edinb. **28**: 139 (1915)–Mukerjee, l.c. 40 (1940).

Hancea Hemsleyana Lév. in Fedde, Rep. **9**: 223 (1911).

Gangtok, 1700 m (Jun. 15, 1960).

Distr. Sikkim, Khasia, N. Burma, and China (Yunnan, Szechuan, Kweichow).

Isodon Maddeni (Benth. ex Hook. f.) Murata in Act. Phytotax. Geobot. **22**: 21 (1966).

Plectranthus Maddeni Benth. ex Hook. f., Fl. Brit. Ind. **4**: 620 (1885)–Mukerjee, l.c. 45 (1940).

Sinduwa, 2100 m (Oct. 24, 1963); Murhay–Sinduwa, 2100 m (Oct. 24, 1963); Bhandukay Bhanjang–Mai Majuwa, 2500 m (Dec. 3, 1963); Mai Majuwa–Mai Pokhari, 1800–1500 m (Dec. 4, 1963).

Distr. Himalaya (Kumaon to Sikkim).

This species is very near to *I. Coetsa*, but has broader fruiting calyx with obtuse teeth.

Isodon repens (Wall.) Murata in Act. Phytotax. Geobot. **22**: 21 (1966).

Plectranthus repens Wallich, Pl. Asia. Rar. **2**: 17 (1831)–Fl. Brit. Ind. **4**: 619 (1885)–Mukerjee, l.c. 46 (1940).

Birwa–Yektin, 1900 m (Nov. 28, 1963).

Distr. E. Himalaya (Nepal, Sikkim).

Isodon scrophularioides (Wall.) Murata in Act. Phytotax. Geobot. **22**: 21 (1966).

Plectranthus scrophularioides Wallich, Pl. Asia. Rar. **2**: 16 (1831)–Hook., Icon. Pl. t. 464 (1842)–Fl. Brit. Ind. **4**: 616 (1886)–Mukerjee, l.c. 41 (1940).

Garibans, 2800 m (Sep. 16, 1964).

Distr. Himalaya (Kumaon to Bhutan).

Isodon striatus (Benth.) Kudo, Lab. Sino-Jap. 134 (1929).

Plectranthus striatus Benth. in Wall., Pl. Asia. Rar. **2**: 17 (1831)-Fl. Brit. Ind. **4**: 618 (1885)-Doan in Fl. Gén. Indo-Chin. **4**: 948 (1936)-Mukerjee, l.c. 43 (1940).

Kakani Hill (Sep. 24, 1963); Kathmandu Airport, 1300 m (Oct. 13, 1963); Sanguri Bhanjang-Dhara Pani, 1000 m (Oct. 16, 1963)); Sinduwa, 2100 m (Oct. 24, 1963); Mul Pokhari-Gorzu Kosir, 2000 m (Oct. 30, 1963); Dumhan-Thaplejung, 1400 m (Nov. 1, 1963); Taplejung-Garhi Danra, 2000-2200 m (Nov. 3, 1963); above Lelep, 2600 m (Nov. 9, 1963); Iladanda-Selap, 1800-2600 m (Nov. 9, 1963); Baroya Khimty, 2500 m (Nov. 11, 1963); Khebang-Siling Tzokupa, 1700-2100 m (Nov. 20, 1963); Birwa-Yektin, 2400-1400 m (Nov. 28, 1963); Halhale Bhanjang-Bhuspate Danra, 2400-2900 m (Dec. 1, 1963).

Distr. Himalaya (Kashmir to N. Assam), N. Burma, Indo-China, and China.

The flowers are white with purple spots on the upper lip.

Isodon ternifolius (D. Don) Kudo, Lab. Sino-Jap. 140 (1929).

Plectranthus ternifolius D. Don, Prodr. Fl. Nepal. 117 (1825)-Fl. Brit. Ind. **4**: 621 (1885)-Mukerjee, l.c. 40 (1940).

Elsholtzia Thompsoni Hook. f., Fl. Brit. Ind. **4**: 643 (1885).

Ghorwa-Sanichare, 300 m (Dec. 10, 1963).

Distr. Tropical Himalaya (Kashmir to Bhutan), Assam, Bengal, Burma, Indo-China, and China (Yunnan, Kweichow, Kwangtung, Kwangsi).

Leonurus sibiricus L., Sp. Pl. ed. 1, 584 (1753)-Fl. Brit. Ind. **4**: 678 (1885)-Doan in Fl. Gén. Indo-Chin. **4**: 1027, f. 107, 6-10 (1936)-Mukerjee, Lab. Ind. 193 (1940)-Hara, Enum. Sperm. Jap. **1**: 210 (1948)-Kup. in Fl. URSS. **21**: 157 (1954).

Biratnagar, 200 m (Oct. 14, 1963).

Distr. Asia, and introduced to Africa and America.

Leucas cephalotes (Roth) Spreng., Syst. Veg. **2**: 743 (1825)-Wight. Icon. t. 337 (1843)-Bois., Fl. Orient. **4**: 779 (1879)-Fl. Brit. Ind. **4**: 689 (1885)-Mukerjee, Lab. Ind. 168 (1940).

Phlomis cephalotes Roth, Nov. Sp. 262 (1821)-Roxb., Fl. Ind. ed. 2, **3**: 10 (1832).

L. capitata Desfontaines, Mem. Mas. Par. **11**: 8, t. 4 (1824).

Gokarna Forest, Kathmandu, 1500 m (Sep. 27, 1963); Dumhan-Taplejung, 700-2000 m (Nov. 1, 1963); Bharomdin-Tharpu, 1000-1200 m (Nov. 25, 1963).

Distr. Afghanistan to India.

Leucas ciliata Benth. in Wallich, Pl. Asia. Rar. **1**: 61 (1830)-Fl. Brit. Ind. **4**: 687 (1885)-Mukerjee, l.c. 174 (1940).

Ghatte-Khebang, 1600-1700 m (Nov. 19, 1963); Khebang-Siling Tzokupa, 1700-2100 m (Nov. 20, 1963).

Distr. Himalaya (Nepal, Bhutan), and India.

Leucas lavandulaefolia Smith in Rees, Cyclop. **20**: 2 (1819)-Kudo, Lab. Sino-Jap. 208 (1929)-Mukerjee, Lab. Ind. 167 (1940).

Leonurus indicus Burm. f., Fl. Ind. 127 (1768).

Phlomis linifolia Roth, Nov. Sp. 260 (1821).

Leucas linifolia (Roth) Spreng., Syst. Veg. **2**: 743 (1825)-Fl. Brit. Ind. **4**: 690 (1885).

Biratnagar, 200 m (Oct. 14, 1963); Ghorwa, 300 m (Dec. 9, 1963); Ghorwa-Sanichare, 300–200 m (Dec. 10, 1963); Sibganja–Mahara Bahara, 200 m (Dec. 12, 1963); Kathgara–Rangali, 200 m (Dec. 14, 1963).

Distr. India, Burma, Malaysia, and S. China (Kwangtung).

Leucas mollissima Wallich, Pl. Asia. Rar. **1**: 62 (1830)–Fl. Brit. Ind. **4**: 682 (1885)–Kudo, Lab. Sino-Jap. 207 (1929)–Doan in Fl. Gén. Indo-Chin. **4**: 1023 (1936)–Mukerjee, l.c. 183 (1940)–Kitamura et Murata in Faun. & Fl. Nepal Himal. 212 (1955).

Rangpo–Tista, 400 m (Jun. 15, 1960); Godavari, 1500 m (Sep. 18, 1963); Sunderijal Waterfall, near Kathmandu, 1600 m (Sep. 20, 1963).

Distr. Nepal, India, Burma, Indo-China, Malaya, and China (Yunnan, Hupeh).

var. **scaberula** Hook. f., Fl. Brit. Ind. **4**: 682 (1885)–Mukerjee, l.c. 184 (1940).

Phusri–Dhara Pani, 1000 m (Oct. 16, 1963); Dhankuta, 1200 m (Oct. 19, 1963); Yamphodin–Ghatte, 2000 m (Nov. 18, 1963); Siling Tzokupa–Khebang, 2100–1700 m (Nov. 22, 1963).

Distr. var. E. Himalaya (Nepal, Sikkim), and Burma.

Leucosceptrum canum Smith, Exot. Bot. **2**: 113, t. 116 (1806)–Fl. Brit. Ind. **4**: 699 (1885)–Hand.-Mzt., Symb. Sin. **7**: 912 (1936)–Doan in Fl. Gén. Indo-Chin. **4**: 1045 (1936)–Mukerjee, Lab. Ind. 214 (1940)–Vautier in Candollea **17**: 48 (1961)–Kitamura et Murata in Act. Phytotax. Geobot. **20**: 168 (1962).

Clerodendron Leucosceptrum D. Don, Prodr. Fl. Nepal. 103 (1825).

Teucrium macrostachyum Wallich ex Bentham, Lab. Gen. Sp. 663 (1834).

Comanthosphace nepalensis Kitam. et Murata in Act. Phytotax. Geobot. **15**: 109 (1954) et in Faun. & Fl. Nepal Himal. 210, f. 51 (1955).

Ghum, Darjeeling, 2200 m (Apr. 4, 1960); Mani Bhanjang–Batasi, 2000–2100 m (May 1, 1960); Dhankuta–Sinduwa, 1200–2100 m (Oct. 22, 1963); Sinduwa, 2100 m (Oct. 24, 1963); Bilbatay Bhanjang–Tinjuray, 2200–2700 m (Oct. 27, 1963); Garhi Danra–Tuwa, 2200–1800 m (Nov. 4, 1963); Zongi–Iladanda, 2600–1800 m (Nov. 12, 1963); Mai Majuwa–Mai Pokhari, 1800–1500 m (Dec. 4, 1963).

Distr. Himalaya (Kumaon to Bhutan), Assam, Burma, Indo-China, and W. China (Yunnan).

The corollae and stamens are yellowish (or rarely purplish) white, and soon turning to dark brown.

Melissa parviflora Benth. in Wallich, Pl. Asia. Rar. **1**: 65 (1830)–Fl. Brit. Ind. **4**: 651 (1885)–Kudo, Lab. Sino-Jap. 97 (1929)–Doan in Fl. Gén. Indo-Chin. **4**: 922 (1936)–Mukerjee, Lab. Ind. 100 (1940).

Geniosporum axillare Benth. in Wall., Pl. Asia. Rar. **2**: 18 (1831).

Yoksam–Bakkim, 2200 m (May 18, 1960, no. 379); Murhay, 2000 m (Oct. 23, 1963); Sinduwa, 2100 m (Oct. 23, 1963); Murhay–Chitray, 2300 m (Oct. 24, 1963); Minchin Dhap–Mul Pokhari, 2500 m (Oct. 29, 1963); Mul Pokhari–Dumhan, 2000 m (Oct. 30, 1963); Yamphodin–Ghatte, 1600–1700 m (Nov. 19, 1963); Ghatte–Khebang, 1900 m (Nov. 19, 1963); Yektin–Batasay (Nov. 30, 1963); Mai Majuwa–Mai Pokhari, 1700 m (Dec. 4, 1963); Darjeeling, 2200 m (Dec. 26, 1963).

Distr. E. Himalaya (Nepal, Sikkim), Assam, Java, S. China, and Formosa.

Mentha arvensis L., Sp. Pl. ed. 1, 577 (1753)–Fl. Brit. Ind. **4**: 648 (1885)–Mukerjee, Lab. Ind. 86 (1940).

Kathmandu Airport, 1400 m (Oct. 13, 1963).

Distr. Europe to N. W. Asia, Afghanistan, and Himalaya (Kashmir to Nepal).

Micromeria biflora Benth., Lab. Gen. Sp. 378 (1834)–Fl. Brit. Ind. **4**: 650 (1885)–Mukerjee, Lab. Ind. 96 (1940).

Kathmandu–Thankot, 1300 m (Sep. 19, 1963); Sunderijal Waterfall, near Kathmandu, 1500 m (Sep. 20, 1963).

Distr. Himalaya (Kashmir to Bhutan).

Microtoena insuavis (Hance) Prain ex Dunn in Not. Bot. Gard. Edinb. **28**: 128 (1915)–Kudo, Lab. Sino-Jap. 183 (1929)–Mukerjee, l.c. 186 (1940).

Gomphostemma insuave Hance in Journ. Bot. **1884**: 231 (1884).

Plectranthus Patchouli C. B. Clarke ex Hook. f., Fl. Brit. Ind. **4**: 624 (1885).

M. cymosa Prain in Hook., Icon. Pl. **19**: t. 1872 (1889); in Journ. Asia. Soc. Beng. **59**: 310 (1890)–Forbes & Hemsl. in Journ. Linn. Soc. **26**: 306 (1890) et **28**: 116 (1890).

Sinduwa, 2100 m (Oct. 24, 1963); above Lelep, 2600 m (Nov. 9, 1963).

Distr. E. Himalaya (Nepal to Assam), Burma, Thai, Indo-China, Malaysia, and W. & S. China (Yunnan, Kweichow, Kwangtung).

Mosla dianthera (Hamilt.) Maxim. in Bull. Acad. Sci. St. Pétersb. **20**: 457 (1875)–Fl. Brit. Ind. **4**: 647 (1885)–Doan in Fl. Gén. Indo-Chin. **4**: 896 (1936)–Hara in Journ. Jap. Bot. **30**: 24 (1955).

Lycopus dianthera Hamilt. in Roxb., Fl. Ind. ed. Carey, **1**: 144 (1820).

M. ocymoides Hamilton ex Bentham in Wallich, Pl. Asia. Rar. **1**: 66 (1830).

M. grosseserrata Maxim. in Bull. Acad. Sci. St. Pétersb. **20**: 458 (1875).

Gokarna Forest, Kathmandu, 1500 m (Sep. 22, 1963).

Distr. Himalaya (Kashmir to Bhutan), Khasia, Bengal, Burma, Indo-China, Philippines, Sumatra, China, Manchuria, Ussuri, Amur, Korea, and Japan.

Notochaete hamosa Bentham in Wallich, Pl. Asia. Rar. **1**: 63 (1830)–Hook., Icon. Pl. t. 1217 (1877)–Fl. Brit. Ind. **4**: 694 (1885)–Mukerjee, Lab. Ind. 202 (1940).

Sinduwa, 2100 m (Oct. 24, 1963); Taplejung–Garhi Danra, 2000–2200 m (Nov. 3, 1963); Iladanda–Selap, 2000 m (Nov. 9, 1963); Zongi–Iladanda 2600–1800 m (Nov. 12, 1963); Diorali Bhanjang–Yamphodin, 2600 m (Nov. 17, 1963); Bhuspate Danra–Mai Majuwa (Dec. 3, 1963); Darjeeling, 2200 m (Dec. 26, 1963 ; Sep. 22, 1964).

Distr. E. Himalaya (Nepal, Sikkim), Assam, and N. Burma.

Ocimum Basilicum L., Sp. Pl. ed. 1, 597 (1753)–Fl. Brit. Ind. **4**: 608 (1885)–Mukerjee, Lab. Ind. 18 (1940)–Kitamura et Murata in Faun. & Fl. Nepal Himal. 214 (1955).

Biratnagar, 200 m (Oct. 14, 1963); Birwa–Yektin, 2400–1400 m (Nov. 28, 1963).

Distr. India, Burma, Malaysia, Polynesia, S. China, and Formosa.

Ocimum canum Sims in Bot. Mag. t. 2452 (1824)–Fl. Brit. Ind. **4**: 607 (1885)–Kudo, Lab. Sino-Jap. 113 (1929)–Mukerjee, l.c. 17 (1940).

Phusri–Sanguri Bhanjang, 1000 m (Oct. 16, 1963).

Distr. Trop. Africa, Madagaskar, W. Asia, India, Burma, S. China, and Java.

Ocimum gratissimum L., Sp. Pl. ed. 1, 1197 (1753)–Fl. Brit. Ind. **4**: 608 (1885)–Mukerjee, l.c. 20 (1940).

Ghorwa–Sanichare, 400 m (Dec. 12, 1963).

Distr. Trop. Africa, Himalaya, India, Ceylon, Java, and Trop. America.

Orthosiphon incurvus Bentham in Wallich, Pl. Asia. Rar. **2**: 15 (1831)-Bot. Mag. t. 3847 (1841)-Fl. Brit. Ind. **4**: 614 (1885)-Mukerjee, Lab. Ind. 24 (1940).

Sanguri Bhanjang-Dhara Pani, 1000 m (Oct. 16, 1963); Dumhan-Taplejung, 1000 m (Nov. 1, 1963); Tuwa-Taplethok, 1400 m (Nov. 5, 1963); Taplethok-Helok, 1500 m (Nov. 6, 1963); Siling Tzokupa-Khebang (Nov. 22, 1963); Khebang-Bharomdin (Nov. 24, 1963); Bharomdin-Tharpu, 1000 m (Nov. 25, 1963); Tharpu-Chyangthaphu, 1200-1100 m (Nov. 26, 1963).

Distr. E. Himalaya (Nepal, Sikkim), Khasia, Naga Hills, and N. Burma.

Perilla frutescens (L.) Britt. in Mem. Torrey Bot. Cl. **5**: 277 (1894)-Hand.-Mzt. in Acta Hort. Gothob. **13**: 350 (1939)-Hara, Enum. Sperm. Jap. **1**: 217 (1948).

Ocimum frutescens L., Sp. Pl. ed. 1, 597 (1753).

P. ocimoides L., Gen. Pl. ed. 6, 578 (1764)-Fl. Brit. Ind. **4**: 646 (1885)-Doan in Fl. Gén. Indo-Chin. **4**: 983 (1936)-Mukerjee, Lab. Ind. 85 (1940).

Dhankuta, 1200 m (Oct. 18, 1963); Sinduwa, 2100 m (Oct. 24, 1963); Khebang-Bharomdin, 1700-1000 m (Nov. 24, 1963); Bharomdin-Tharpu, 1000-1200 m (Nov. 25, 1963); Ghorwa-Sanichare, 300-200 m (Dec. 10, 1963).

Distr. Himalaya (Kashmir to Bhutan), Khasia, Burma, Indo-China, S. China, and Formosa.

Phlomis setigera Falc. ex Benth. in DC., Prodr. **12**: 543 (1848)-Fl. Brit. Ind. **4**: 693 (1885)-Mukerjee, Lab. Ind. 196 (1940).

Migothang, 3750 m (May 31, 1960); Phalut, 3500 m (Jun. 5, 1960).

Distr. Temperate Himalaya (Kashmir to Bhutan).

var. **filiformis** Hook. f., Fl. Brit. Ind. **4**: 693 (1885).

Nayathang-Phalut, 3500 m (Jun. 2, 1960); Garibans-Tonglu, 2800 m (Jun. 5, 1960); Phalut, 3500 m (Jun. 5, 1960).

Distr. var. E. Himalaya (Sikkim).

The veriety differs from its mother species in having soft and not spinescent bracts.

Phlomis tibetica Marquand et Shaw in Journ. Linn. Soc. **48**: 218 (1929)-Mukerjee, l.c. 197 (1940).

Along the Choktsering Chu, north of Jongri, 4000-4500 m (May 25, 1960).

Distr. E. Himalaya (Sikkim), and Tibet.

Plectranthus incanus Link, Enum. Hort. Berol. **2**: 120 (1821)-Benth. in DC., Prodr. **12**: 66 (1848)-Fl. Brit. Ind. **4**: 621 (1885)-Mukerjee, Lab. Ind. 47 (1940).

Kathmandu, 1300 m (Sep. 17, 1963); Balaju Water Garden, Kathmandu, 1300 m (Sep. 23, 1963); Phusri-Sanguri Bhanjang, 800 m (Oct. 16, 1963).

Distr. E. Himalaya (Nepal, Sikkim), and India.

Pogostemon amaranthoides Bentham in DC., Prodr. **12**: 153 (1848)-Fl. Brit. Ind. **4**: 634 (1885)-Mukerjee, Lab. Ind. 71 (1940).

Palmajua-Rimbick, 2000 m (May 5, 1960); Taplejung, 1700 m (Nov. 2, 1963); Taplejung-Garhi Danra, 1800 m (Nov. 3, 1963); Helok-Iladanda, 1600 m (Nov. 8, 1963); Ghatte-Khebang, 1700 m (Nov. 19, 1963); Mai Majuwa-Dhara Pani, 1800-1500 m (Dec. 4, 1963).

Distr. E. Himalaya (E. Nepal, Sikkim), and Khasia.

Pogostemon brachystachyus Bentham in DC., Prodr. **12**: 156 (1848)-Fl. Brit. Ind. **4**: 637 (1885)-Mukerjee, l.c. 77 (1940).

Gangtok, 1500 m (Mar. 18, 1963).

Distr. E. Himalaya (Sikkim), Assam, and N. Burma.

Pogostemon tuberculosus Bentham in Wallich, Pl. Asia. Rar. **1**: 31 (1830) -Fl. Brit. Ind. **4**: 633 (1885)-Mukerjee, l.c. 70 (1940).

Kurseong, Darjeeling, 1550 m (Apr. 12, 1960, no. 786).

Distr. E. Himalaya (Nepal to Bhutan).

Prunella vulgaris L., Sp. Pl. ed. 1, 600 (1753)-Fl. Brit. Ind. **4**: 670 (1885)-Mukerjee, Lab. Ind. 148 (1940)-Hara in Journ. Fac. Sci. Univ. Tokyo Bot. **6**: 369 (1956)-Murata in Kitamura, Fl. Afghan. 344 (1960).

Sinduwa, 1100 m (Oct. 24, 1963); Murhay, 2000 m (Oct. 24, 1963); Hati Sar-Minchin Dhap, 2700–2800 m (Oct. 28, 1963); Minchin Dhap–Mul Pokhari, 2700 m (Oct. 29, 1963); Birwa-Yektin, 2500 m (Nov. 28, 1963); Bilbatay Bhanjang, 2200 m (Oct. 26, 1963); Bhuspate Danra, 2600 m (Dec. 2, 1963); Penlong La, Gangtok, 2100 m (Jun. 16, 1960, no. 5563); Senchal-Tigar Hill, 2400–2500 m (Jun. 23, 1960).

Distr. Europe, N. Africa, Asia Minor, Afghanistan, Iran, Caucasus, C. Asia, Himalaya (Kashmir to Sikkim), and Siberia.

Salvia campanulata Wall. ex Benth. var. **hirtella** Peter-Stibal in Fedde, Rep. **39**: 179 (1936)-Mukerjee, Lab. Ind. 115 (1940).

Kala Pokhari-Sandakphu, 1400 m (Sep. 16, 1964).

Distr. E. Himalaya (Nepal to Bhutan).

Salvia coccinea L., Mant. Pl. **1**: 88 (1767).

Tista Bazar–Kalimpong, 1000 m (Jun. 19, 1960); Nissim–Dumhan, 1200 m (Oct. 30, 1963); Dumhan–Taplejung (Oct. 31, 1963); Illam–Ranga Pani (Dec. 8, 1963).

Distr. Introduced from tropical America.

Salvia leucantha Cavan., Icon. **1**: 16, t. 24 (1791)-Hook. in Bot. Mag. t. 4318 (1848).

Mai Majuwa–Mai Pokhari, 1700 m (Dec. 4, 1963); Dhara Pani–Illam, 1300 m (Dec. 5, 1963).

Distr. Introduced from Mexico.

Scutellaria discolor Colebr. in Wallich Pl. Asia. Rar. **1**: 66 (1830)-Fl. Brit. Ind. **4**: 667 (1885)-Doan in Fl. Gén. Indo-Chin. **4**: 1000 (1936)-Mukerjee, Lab. Ind. 146 (1940)-Kitamura & Murata in Faun. & Fl. Nepal Himal. 215 (1955).

Gokarna Forest, northeast of Kathmandu, 1500 m (Sep. 22, 1963); Kathmandu, 1300 m (Oct. 13, 1963); Phusri–Sanguri Bhanjang, 1000 m (Oct. 16, 1963); Dhankuta, 1200 m (Oct. 19, 1963); Bharomdin–Tharpu, 1000–1200 m (Nov. 25, 1963); Yektin, 1100 m (Nov. 29, 1963).

Distr. Himalaya (Kumaon to Bhutan), Assam, Khasia, Java, Indo-China, and W. China (Yunnan).

Scutellaria repens Hamilt. ex D. Don, Prodr. Fl. Nepal. 110 (1825)-Fl. Brit. Ind. **4**: 669 (1885)-Mukerjee, l.c. 146 (1940)-Kitamura & Murata, l.c. 216 (1955).

Godavari, near Kathmandu, 1500 m (Sep. 18, 1963); Taplejung, 1200 m (Nov. 2, 1963); Taplejung–Garhi Danra, 2000–2200 m (Nov. 3, 1963); Tuwa–Taplethok, 1500 m

(Nov. 5, 1963); Iladanda–Helok, 1800–1500 m (Nov. 13, 1963); Birwa–Yektin, 2400–1400 m (Nov. 28, 1963); Yektin, 1100 m (Nov. 29, 1963); Dhara Pani–Illam, 1300 m (Dec. 5, 1963); Illam, 1200 m (Dec. 6, 1963).

Distr. Himalaya (Kashmir to Sikkim), and Burma.

Scutellaria violacea Heyne ex Benth. in Wall., Pl. Asia. Rar. **1**: 66 (1830).

var. **sikkimemsis** Hook. f., Fl. Brit. Ind. **4**: 668 (1885)–Mukerjee, l.c. 145 (1940).

Darjeeling, 2100 m (Apr. 1, 1960; Dec. 26, 1963, fr.; Sep. 10, 1964, fl.).

Distr. E. Himalaya (Sikkim).

Teucrium quadrifarium Hamilt. in D. Don, Prodr. Fl. Nepal. 108 (1825)–Fl. Brit. Ind. **4**: 701 (1885)–Kudo, Lab. Sino-Jap. 292 (1929)–Mukerjee, l.c. 218 (1940).

T. Fortunei Benth. in DC., Prodr. **12**: 583 (1848).

Pouwa, Kathmandu, 1600 m (Oct. 9, 1963).

Distr. Himalaya (Kashmir to Sikkim), Khasia, N. Burma, Thai, and China.

Teucrium viscidum Blume, Bijdr. **14**: 827 (1825)–Fl. Brit. Ind. **4**: 700 (1885)–Mukerjee, l.c. 218 (1940)–Hara, Enum. Sperm. Jap. **1**: 232 (1948).

Gangtok–Saramsa Medicinal Garden, 1650–1000 m (Jun. 17, 1960); Gangtok–Rangpo, 800 m (Jun. 18, 1960).

Distr. Himalaya, N. E. India, Burma, W. & S. China, Formosa, Korea, Japan, and Malaysia.

SOLANACEAE (by Takasi Yamazaki)

Capsicum annuum L., Sp. Pl. ed. 1, 188 (1753).

Bharomdin–Tharpu, 1000–1200 m (Nov. 25, 1963, fr.).

var. **cerasiforme** (Mill.) Irish in Rep. Miss. Bot. Gard. **9**: 53 (1898)–Haines, Bot. Bihar Orissa **4**: 609 (1922).

Capsicum cerasiforme Miller, Gard. Dict. ed. 8, no. 5 (1768).

Capsicum grossum Willd. var. *cerasiforme* (Mill.) C. B. Clarke in Hooker f., Fl. Brit. Ind. **4**: 239 (1883).

Tuwa–Taplethok, 1800–1300 m (Nov. 5, 1963).

Distr. sp. Widely cultivated.

Capsicum frutescens L., Sp. Pl. ed. 1, 189 (1753)–Haines, l.c. **4**: 609 (1922).

Darjeeling (Dec. 17, 1960); Phusri–Dhara Pani (Oct. 16, 1963, fr.); Illam–Ranga Pani, 1200–700 m (Dec. 8, 1963).

Distr. Cult. in tropies, probably native of S. America.

Cestrum aurantiacum Lindley in Bot. Reg. 71 (1844)–Bailey in Cycl. Amer. Hort. ed. 4, **2**: 285 (1906).

Senchal, 2400 m (Apr. 16, 1960, no. 1957); Gangtok, 1600 m, cult. (Jun. 15, 1960); Below Yektin–Akasay, 1400–2300 m (Nov. 30, 1963, fl. orange); Bhuspate Danra–below Mai Majuwa, 2900–1600 m (Dec. 3, 1963); below Mai Majuwa–Dhara Pani, 1600–1500 m (Dec. 4, 1963).

Distr. A native of tropical America; cultivated in the tropics.

Cestrum elegans Schlecht. in Linnaea **19**: 261 (1847)–Bailey, l.c. 285 (1906).

Pamianchi, 2000 m, cult. (May 14, 1960); Happy Valley, Darjeeling, 1900 m (Jun. 26, 1960); Yektin–Akasay, 1400–2300 m (Nov. 30, 1963); Mai Majuwa–Dhara Pani, 1600–1500 m (Dec. 4, 1963).

Distr. A native of tropical America; cultivated in the tropics.

Cestrum nocturnum L., Sp. Pl. ed. 1, 191 (1753)–Bailey, l.c. 285 (1906)–Merrill, Enum. Philip. Pl. **3**: 430 (1923)

Dhara Pani–Illam, 1500–1200 m (Dec. 5, 1963).

Distr. A native of tropical America, widely cultivated in the tropics.

Cestrum Parqui L'Hérit., Stip. Nov. 73 (1784–85)–Bailey, l.c. 285 (1906)–Rehder, Man. ed. 2, 814 (1940).

Kathmandu (Sep. 17, 1963); Kathmandu Airport, 1400 m (Oct. 13, 1963).

Distr. A native of tropical America, cultivated in the tropics.

Datura Metel L., Sp. Pl. ed. 1, 179 (1753)–Fl. Brit. Ind. **4**: 243 (1883).

Biratnagar, 200 m (Oct. 14, 1963); Dhankuta, 1200 m (Oct. 19, 1963); Dhankuta, 1200 m (Oct. 19, 1963, fl. double purple).

Distr. A native of tropical America; widely naturalized in the Old World.

Datura Stramonium L., Sp. Pl. ed. 1, 179 (1753)–Fl. Brit. Ind. **4**: 242 (1883).

Dhankuta, 1200 m (Oct. 19, 1963).

Distr. A native of tropical America ; widely naturalized in the tropics.

Datura suaveolens Humb. et Bonpl. ex Willd., Enum. Hort. Berol. 227 (1809)–Haines, l.c. 614 (1922).

Dhankuta, 1200 m (Oct. 19, 1963); Taplejung, 1700 m (Nov. 2, 1963).

Distr. A native of tropical America; cultivated in the tropics.

Mandragora caulescens Clarke in Hooker f., Fl. Brit. Ind. **4**: 242 (1883).

Jongri, 4000 m (May 19 & 22, 1960); Jongri–Gamothang (May 26, 1960).

Distr. E. Himalaya (Sikkim), and W. China (Yunnan, Szechuan).

Nicandra physaloides Gaertn., Fruct. et Sem. **2**: 237 (1791)–Fl. Brit. Ind. **4**: 240 (1883).

Happy Valley, Darjeeling, 1900 m (Jun. 26, 1960); Kathmandu (Oct. 13, 1963); Phusri–Dhara Pani, 450–900 m (Oct. 16, 1963); Illam, 1200 m (Dec. 7, 1963).

Distr. A native of tropical America; escaped throughout the tropics.

Nicotiana plumbaginifolia Viviani, Elench. Pl. Hort. 26 (1802)–Fl. Brit. Ind. **4**: 246 (1883)–Haines, l.c. 616 (1922).

Kathmandu Airport, 1400 m (Oct. 13, 1963).

Distr. A native of tropical America; naturalized in India.

Nicotiana Tabacum L., Sp. Pl. ed. 1, 180 (1753)–Fl. Brit. Ind. **4**: 245 (1883).

Taplethok–Helok, 1300–1500 m (Nov. 6, 1963).

Distr. A native of South America; cultivated in the World.

Physalis peruviana L., Sp. Pl. ed. 2, 1670 (1763)–Fl. Brit. Ind. **4**: 238 (1883).

Gangtok, 1650 m (Jun. 15, 1960); Kathmandu, 1400 m (Oct. 13, 1963).

Distr. A native of tropical America; cultivated in the tropics.

Solanum aculeatissimum Jacq., Coll. **1**: 100 (1786)–Fl. Brit. Ind. **3**: 237 (1883).

Kurseong, 1600 m (Apr. 12, 1960); Gangtok–Saramsa Medicinal Garden, roadside, 1500 m (Jun. 17, 1960); Biratnagar, 200 m (Oct. 14, 1963); Dumhan–Taplejung, 700–2000 m (Nov. 1, 1963); Ghatte–Khebang, 1600–1700 m (Nov. 19, 1963).

Distr. Himalaya, E. India, Indo-China, S. China, and Malaya.

Solanum biflorum Loureiro, Fl. Cochinch. **1**: 129 (1790)–Fl. Brit. Ind. **4**: 232

(1883).

Lycianthes biflora (Lour.) Bitter in Abh. Nat. Ver. Bremen **24**: 461 (1919).

Iladanda–Selap, 1800–2600 m (Nov. 9, 1963); Khebang–below Siling Tzokupa, 1700–2100 m (Nov. 20, 1963); Yektin–Batasay, 1400–2400 m (Nov. 30, 1963); Mai Majuwa–Dhara Pani, 1600–1500 m (Dec. 4, 1963).

Distr. Throughout tropical and subtropical Asia, New Guinea and Hawaii.

Solanum crassipetalum Wallich in Roxburgh, Fl. Ind. ed. Carey, **2**: 256 (1824)-Fl. Brit. Ind. **4**: 232 (1883)-Merrill, Enum. Philip. Pl. **3**: 424 (1923).

Phusri–Dhara Pani, 450–900 m (Oct. 16, 1963); Ghatte–Khebang, 1600–1700 m (Nov. 19, 1963); Khebang–Siling Tzokupa, 1700–2100 m (Nov. 20, 1963); Tharpu–Chyangthaphu, 1200–1100 m (Nov. 26, 1963).

Distr. Himalaya (Nepal to Bhutan) and Philippines.

Solanum indicum L., Sp. Pl. ed. 1, 187 (1753)–Fl. Brit. Ind. **4**: 234: (1883).

Khebang–Bharomdin, 1700–1000 m (Nov. 24, 1963); Tharpu–near Chyangthaphu, 1200–1100 m (Nov. 26, 1963); Illam, 1200 m (Dec. 7, 1963).

Distr. India, Malaya, Indo-China, Philippines, and Formosa.

Solanum lysimachioides Wallich in Roxburgh, Fl. Ind. ed. Carey, **2**: 259 (1824), excl. syn. *S. biflorum*-Nees in Trans. Linn. Soc. **17**: 44 (1837).

Solanum macrodon Wall. var. *lysimachioides* (Wall.) C. B. Clarke in Hooker f., l.c. 232 (1883).

Lycianthes lysimachioides (Wall.) Bitter, l.c. 491 (1919)

Murhay, 2000 m (Oct. 23, 1963); Bilbatay Bhanjang–Hati Sar, 2200–2700 m (Oct. 27, 1963).

Distr. Temperate Himalaya (Kumaon to Bhutan), Khasia, and Western China (Yunnan, Szechuan, Kweichow).

Solanum Melongena L., Sp. Pl. ed. 1, 186 (1753)–Fl. Brit. Ind. **4**: 235 (1883).

Dhara Pani–Illam, 1500–1200 m (Dec. 5, 1963).

Distr. Cultivated in subtropical and warm regions, escaped.

Solanum nigrum L., Sp. Pl. ed. 1, 186 (1753)–Fl. Brit. Ind. **4**: 229 (1883).

Rangpo–Tista, 350–300 m (Jun. 18, 1960); Yoksam–Bakkim, 1700–2200 m (May 18, 1960); Gangtok, 1600 m (Jun. 13, 1960); Kathmandu, 1400 m (Sep. 17, 1963); Murhay, 2000 m (Oct. 23, 1963); Baroya Khimty–Thakma Khola, 2500–3300 m (Nov. 16, 1963); Illam, 1200 m (Dec. 5, 1963); Sibganja–Mahara Bahara, 200 m (Dec. 12, 1963).

Distr. Cosmopolitan.

Solanum pachypetalon Sprengel, Syst. Veg. **4** (2): 72 (1727).

Solanum macrodon Wall. ex Nees in Trans. Linn. Soc. **17**: 43 (1837).

Lycianthes macrodon (Wall.) Bitter, l.c. 468 (1919).

Yoksam–Bakkim, 1700–2200 m (May 18, 1960).

Distr. Himalaya (Nepal to Bhutan), and Khasia.

Solanum pseudo-capsicum L., Sp. Pl. ed. 1, 184 (1753).

Kathmandu, 1400 m (Sep. 17, 1963).

Distr. A native of tropical America; widely cultivated.

Solanum torvum Swartz, Prodr. 47 (1788)–Fl. Brit. Ind. **4**: 234 (1883).

Tista, 350 m (Apr. 23, 1960); Rangpo–Tista, 350–300 m (Jun. 18, 1960); Sombari–Naya Bazar, 700 m (Mar. 27, 1963, fl. white); Dhara Pani–Dhankuta, 900–1200 m (Oct. 17, 1963); Tuwa–Taplethok, 1800–1300 m (Nov. 5, 1963); Tharpu–Chyangthaphu, 1200–1100 m (Nov. 26, 1963); Ranga Pani–Ghorwa, 700–300 m (Dec. 9, 1963);

Sanichare–Sibganja, 200 m (Dec. 11, 1963).

Distr. India, Malaya, Indo-China, Philippines and southern China.

Solanum verbascifolium L., Sp. Pl. ed. 1, 184 (1753)–Fl. Brit. Ind **4**: 230 (1883).

Biratnagar, 200 m (Oct. 15, 1963).

Distr. India, Malaya, Indo-China, northern Australia, and tropical America.

SCROPHULARIACEAE (by Takasi Yamazaki)

Adenosma indianum (Lour.) Merrill in Trans. Amer. Philos. Soc. n. s. **24** (2): 351 (1935).

Manulea indiana Lour., Fl. Cochinch. 386 (1790).

A. capitatum (Bentham) Hance in Journ. Linn. Soc. **13**: 114 (1873).

A. capitatum (Benth.) Bentham ex Hooker f., Fl. Brit. Ind. **4**: 264 (1884)

A. bilabiatum (Roxb.) Merrill, Enum. Philip. Pl. **3**: 434 (1923).

Sanichare–Sibganja, 200 m (Dec. 11, 1963, fr.).

Distr. India, Malacca, Burma, Indo-China, and S. China.

Buchnera hispida Hamilton ex D. Don, Prodr. Fl. Nepal. 91 (1825)–Fl. Brit. Ind. **4**: 298 (1884)–Pennell in Acad. Nat. Sci. Philad. Monogr. **5**: 27 (1943).

Dumhan–Taplejung (Oct. 13 & Nov. 1, 1963).

Distr. Africa, and Northern and Central India.

Calceolaria mexicana Bentham in DC., Prodr. **10**: 205 (1846)–Fl. Brit. Ind. **4**: 246 (1883), in nota–Kränzlin in Pfl.-reich IV–257 C, Ht. **28**: 27, t. 4 (1907).

Mani Bhanjang–Batasi, 2000 m (May 1, 1960); Happy valley, 1900 m (Jun. 24, 1960); Bhuspate Danra, 2600 m (Dec. 2, 1961, fl.); Mai Majuwa–Dhara Pani, 1800–1500 m (Dec. 4, 1963, fr.); Batasay–Bhuspate Danra, 2400–2900 m (Dec. 1, 1963, fl.).

Distr. A native of Mexico; naturalized in eastern India.

Centranthera grandiflora Bentham, Scroph. Ind. 50 (1835)–Fl. Brit. Ind. **4**: 301 (1884)– Bonati in Fl. Gén. Indo-Chin. **4**: 449 (1930).

Dhankuta, 1200 m (Oct. 20, 1963, fr.); Khebang–Bharomdin (Nov. 24, 1963, fr.); Tharpu–Chyangthaphu (Nov. 26, 1963, fr.).

Distr. Himalaya (Nepal to Sikkim), Khasia, and Indo-China.

Centranthera nepalensis D. Don, Prodr. Fl. Nepal. 88 (1825)–Pennell, l.c. 93 (1943).

Gokarna forest, northeast of Kathmandu, 1500 m (Sep. 23, 1963); Sibganja–Gauriganja, 200 m (Dec. 12, 1963, fl.).

Distr. Himalaya, and N. India.

Dopatrium junceum (Roxb.) Hamilton ex Bentham, Scroph. Ind. 31 (1835)–Fl. Brit. Ind **4**: 274 (1884)–Pennell, l.c. 24 (1943).

Gratiola juncea Roxb., Pl. Corom. **2**: 16, t. 129 (1798).

Mul Pokhari–Dumhan, 2400–700 m (Oct. 30, 1963, fl.); Sibganja–Gauriganja, 200 m (Dec. 12, 1963, fl.).

Distr. Widespread over the temperate–tropical Asia, and Australia.

Ellisiophyllum pinnatum (Wall.) Makino in Bot. Mag. Tokyo **20**: 91 (1906)–Brand in Pfl.-reich IV–251, Ht. **59**: 186 (1913)–Merrill, Enum. Philip. Pl. **3**: 441 (1923).

Mazus pinnatus Wall., Cat. no. 3915 (1831), nom. nud.

Ourisia pinnata Wall. in Bentham, Scroph. Ind. 47 (1835).

Sibthorpia pinnata (Wall.) Bentham ex Hooker f., Fl. Brit. Ind **4**: 288 (1884).

Moseleya pinnata (Wall.) Hemsley in Hooker, Icon. Pl. t. 2592 (1898).

Bhuspate Danra, 2900 m (Dec. 1, 1963).

Distr. E. Himalaya (Nepal, Sikkim), W. China, Formosa, and Philippines (Luzon).

Hemiphragma heterophyllum Wall. in Trans. Linn. Soc. **13**: 612 (1822)-Fl. Brit. Ind. **4**: 289 (1884)-Pennell, l.c. 62 (1943).

Darjeeling, 2150 m (Apr. 1, 1960); Victoria Fall, 1900 m (Apr. 3, 1960); Mani Bhanjang-Batasi, 2000–2100 m (May, 1, 1960); Sandakphu 3600 m (May 7, 1960); Ramam-Phalut, 2200–3600 m (May 9, 1960); Bakkim-Jongri, 2500–4000 m (May 19, 1960); Jongri-Olothang, 4000–3600 m (May 23, 1960); Migothang, 3900 m (May 31, 1960); Nayathang-Phalut, 3300–3600 m (Jun. 2, 1960); Garibans-Tonglu, 2800–3000 m (Jun. 7, 1960); Penlong La, Gangtok, 2100 m (Jun. 16, 1960); Birch Hill, 2000 m (Jun. 25, 1960); Kakani 2100–2200 m (Sep. 24, 1963, fr. red); Dhankuta-Sinduwa, 1200–2100 m (Oct. 22, 1963); Dhankuta-Murhay, 1200–2100 m (Oct. 23, 1963); Sinduwa, Dhankuta Dist., 2100 m (Oct. 23, 1963, fr. red); Selap-Walunchung Gola, 2600–3500 m (Nov. 10, 1963, fr.); Baroya Khimty-Thakma Khola, 2500–3300 m (Nov. 16, 1963, fr.); Batasay-Bhuspate Danra, 2400–2900 m (Dec. 1, 1963, fr.).

Distr. E. Himalaya (Nepel to Bhutan), W. China (Yunnan, Szechuan, Kweichow), Formosa, and Philippines (Luzon).

Lagotis kunawurensis (Royle) Ruprecht in Mem. Acad. Sci. St.-Péters. ser. 7, **14**: 64 (1869)-Pennell, l.c. 68 (1943).

var. **sikkimensis** (Hooker f.) Yamazaki, comb. nov.

Lagotis glauca var. *sikkimensis* Hooker f., Fl. Brit. Ind. **4**: 560 (1885)-Prain in Journ. Asia. Soc. Beng. **65**: 65 (1896).

Gamothang-Migothang, 3900 m (May 30, 1960, fl. white, tinged blue); Jongri-Gamothang, 4000 m (May 26, 1960); Jongri, 4000 m (May 24, 1960); Jongri, 4100 m (May 23, 1960).

Distr. var. E. Himalaya (Nepal, Sikkim).

Limnophila aromatica (Lam.) Merrill, Interpr. Rumph. Herb. Amboin. 466 (1917).

Ambulia aromatica Lamarck, Encycl. Méth. **1**: 128 (1783).

Limnophila gratissima Blume, Bijdr. 750 (1826)-Fl. Brit. Ind. **4**: 268 (1884).

Sibganja-Gauriganja, 2000 m (Dec. 12, 1963, fl.).

Distr. Widespread over the temperate-tropical Asia.

Limnophila balsamea (Benth.) Bentham in DC., Prodr. **10**: 386 (1846)-Fl. Brit. Ind. **4**: 266 (1884)-Bonati in Fl. Gén. Indo-Chin. **4**: 374 (1930).

Stemodia balsamea Benth. in Bot. Reg. **17**: sub t. 1470 (1831); Scroph. Ind. 23 (1835).

Ghorwa-Sanichare, 300–200 m (Dec. 10, 1963, fr.).

Distr. India, Burma, and Indo-China.

Limnophila indica (L.) Druce in Rep. Bot. Exch. Cl. Brit. Is. **3**: 420 (1914)-Trimen, Hand-Book Fl. Ceylon **6**: 211 (1931).

Hottonia indica L., Syst. Nat. ed. 10, 919 (1759).

Limnophila gratioloides R. Brown, Prodr. Fl. Nov. Holl. 442 (1810)-Fl. Brit. Ind.

4: 271 (1884).

Kathgara-Rangali, 200 m (Dec. 14, 1963, fl.).

Distr. Widespread over the tropical regions of Asia, Africa and Australia.

Limnophila sessiliflora (Vahl) Blume, Bijdr. 749 (1826)-Fl. Brit. Ind. **4**: 270 (1884).

Hottonia sessiliflora Vahl, Symb. **2**: 36 (1791).

Ghorwa-Sanichare, 300-200 m (Dec. 10, 1963, fl.); Mahara Bahara-Kathgara, 200 m (Dec. 13, 1963).

Distr. Widespread over the temperate-tropical Asia.

Linaria Cymbalaria (L.) Mill., Gard. Dict. ed. 8, n. 17 (1768)-Bentham in DC., Prodr. **10**: 266 (1846).

Antirrhinum Cymbalaria L., Sp. Pl. ed. 1, 612 (1753).

Darjeeling, 2100 m (Jun. 24, 1960).

Distr. A native of southern Europe; naturalized in eastern India.

Lindenbergia grandiflora (Hamilt.) Bentham, Scroph. Ind. 22 (1835)-Fl. Brit. Ind. **4**: 261 (1884)-Pennell, l.c. 24 (1943).

Stemodia grandiflora Hamilton ex D. Don, Prodr. Fl. Nepal. 89 (1825).

Butia Basti, 2000 m (Apr. 6, 1960); Phusri-Dhara Pani, 450-1200 m (Oct. 16, 1963, fl.); Dhara Pani-Dhankuta, 300-1200 m (Oct. 17, 1963, fl.); Dhankuta, 1200 m (Oct. 19, 1963, fl. yellow); Dumhan-Taplejung, 700-2000 m (Nov. 1, 1963); Garhi Danra-Tuwa, 2200-1800 m (Nov. 4, 1963); Khebang-Siling Tzokupa, 1700-2100 m (Nov. 20 & 22, 1963, fl. yellow); Bharomdin-Tharpu, 1000-1200 m (Nov. 25, 1963); Tharpu, 1200 m (Nov. 26, 1963, fl.); Dhara Pani-Illam, 1500-1200 m (Dec. 5, 1963, fl.); Illam, 1200 m (Dec. 6, 1963, fl.).

Distr. Throughout India, and Burma.

Lindenbergia indica (L.) Vatke in Oester. Bot. Zeits. **25**: 10 (1875)-O. Kuntze, Rev. Gen. Pl. 462 (1891)-Blatter et Hallberg in Journ. Bombay Nat. Hist. Soc. **25**: 424 (1918).

Dodartia indica L., Sp. Pl. ed. 1, 633 (1753).

Stemodia ruderalis Retz., Observ. Bot. **5**: 25 (1789).

Lindenbergia polyantha Royle ex Bentham, Scroph. Ind. 22 (1835)-Fl. Brit. Ind. **4**: 262 (1884).

Lindenbergia ruderalis (Retzius) Voigt, Hort. Suburb. Calcutta 501 (1845)-Pennell, l.c. 25 (1943).

Butia Basti, 2000 m (Apr. 6, 1960); Gangtok, 1650 m (Jun. 16, 1960; Sep. 10, 1964); Kathmandu, 1400 m (Sep. 17, 1963), Dhankuta, 1200 m (Oct. 20, 1963); Sunderijal Waterfall, 1600 m (Sep. 20, 1963); Darjeeling, 2150 m (Sep. 10, 1964, fl. yellow).

Distr. Throghout tropical Asia from Afghanistan to S. China.

Lindernia parviflora (Roxb.) Haines, Bot. Bihar Orissa **4**: 635 (1922)-Mukerjee in Journ. Ind. Bot. Soc. **24**: 132 (1945).

Gratiola parviflora Roxb., Pl. Corom. **3**: 3, t. 204 (1819).

Ilysanthes parviflora (Roxb.) Bentham in DC., Prodr. **10**: 419 (1846)-Fl. Brit. Ind. **4**: 283 (1884).

Kathmandu-Thankot (Sep. 19, 1963, fr.); Mul Pokhari-Dumhan, 2400-700 m (Oct. 30, 1963); Dumhan-Taplejung, 700 m (Oct. 31, 1963, fr.); Bharomdin-Tharpu, 1000-1200 m (Nov. 25, 1963, fl.); Sibganja-Mahara Bahara, 200 m (Dec. 12, 1963, fr.);

Gauriganja–Rangali, 200 m (Dec. 13, 1963, fr.); Mahara Bahara–Kathgara, 200 m (Dec. 13, 1963, fr.).

Distr. India, Burma, Indo-China, Malaya, and tropical Africa.

Lindernia procumbens (Krock.) Philcox in Taxon **14**: 30 (1965).

Lindernia Pyxidaria L., Mant. Pl. **2**: 252 (1771)–Pennell, l.c. 28 (1943).

Vandellia erecta Bentham in DC., Prodr. **10**: 415 (1846)–Fl. Brit. Ind. **4**: 281 (1884).

Mahara Bahara–Kathgara, 200 m (Dec. 13, 1963, fr.).

Distr. Throughout Europe and Asia from tropical to warm regions, southward to India, Malaya and Polynesia.

Mazus Delavayi Bonati in Bull. Herb. Boiss. ser. 2, **8**: 530 (1908)–Pennell, l.c. 34 (1943).

Mazus divaricatus Bonati, l.c. 534 (1908).

Rayang, 250 m (Apr. 20, 1960); Kalimpong, 1300 m (Apr. 23, 1960, fl.).

Distr. Himalaya (Peshawar to Sikkim), and W. China (Yunnan).

Mazus dentatus Wallich ex Bentham, Scroph. Ind. 27 (1835); in DC., Prodr. **10**: 375 (1846)–Fl. Brit. Ind. **4**: 260 (1884)–Pennell, l.c. p. 33 (1943).

Rimbick–Ramam, 1900–2400 m (May 7, 1960); Ghum–Senchal, 2250 m (Apr. 4, 1960, fl. purple and leaves dark purple beneath); Batasi–Palmajua, 2300–2600 m (May 3, 1960); Gangtok, 1650 m (Mar. 23, 1963).

Distr. Himalaya (Kumaon to N. Assam).

Mazus japonicus (Thunberg) O. Kuntze, Rev. Gen. Pl. 462 (1891).

Lindernia japonica Thunberg, Fl. Jap. 253 (1784).

Mazus rugosus Lour., Fl. Cochinch. 385 (1790)–Fl. Brit. Ind. **4**: 259 (1884).

Gratiola goodenifolia Hornem., Enum. Pl. Hort. Hafn. 19 (1807).

Mazus goodenifolius (Hornemann) Pennell in Journ. Arn. Arb. **24**: 249 (1943)–Pennell, l.c. 34 (1943).

Rayang, 250 m (Apr. 20, 1960); Takdah, 1600–1700 m (Apr. 18, 1960); Gangtok, 1650 m (Mar. 23, 1963); Kathmandu Airport, 1400 m (Oct. 13, 1963, fr.); Dhankuta, 1200 m (Oct. 21, 1963, fl.); Dumhan, by the Tamur river, 700 m (Oct. 31, 1963); near Chyangthaphu–Birwa, 1100–2400 m (Nov. 27, 1963).

Distr. Common weed throughout south-eastern Asia from India to Japan and Korea.

Mazus surculosus D. Don, Prodr. Fl. Nepal. 87 (1825), ut *surculosa*–Fl. Brit. Ind. **4**: 260 (1884).

Takdah, 1600–1700 m (Apr. 18, 1960); Kurseong, 1550 m (Apr. 12, 1960); Mani Bhanjang–Batasi, 2000 m (May 1, 1960); Gangtok, 1600 m (Jun. 15, 1960); Hati Sar–Minchin Dhap, 2700–2900 m (Oct. 28, 1963, fl.); Garhi Danra–Tuwa, 2200–1600 m (Nov. 4, 1963); Dhankuta–Murhay, 1200–2000 m (Oct. 23, 1963, fr.).

Distr. Throughout Himalaya (Udhampur to Assam).

Melasma arvense (Bentham) Handel-Mazzetti, Symb. Sin. **7**: 843 (1936).

Glossostylis arvense Bentham in DC., Prodr. **10**: 339 (1846).

Alectra indica Bentham in DC., Prodr. **10**: 339 (1846)–Fl. Brit. Ind. **4**: 297 (1884).

Alectra arvensis (Bentham) Merrill in Philip. Journ. Sci. **12**: 109 (1917).

M. arvense (Bentham) Pennell, l.c. 92 (1943).

Kakani Hill, northwest of Kathmandu, 2200 m (Sep. 24, 1963, fl. yellow); Pouwa, Kathmandu, 1600 m (Oct. 9, 1963, fr.); Dhankuta, 1200 m (Oct. 9, 1963, fr.); Dhankuta-Murhay, 1200–2000 m (Oct. 23, 1963, fl.); Khebang-Baromdin, 1700–1000 m (Nov. 24, 1963); Chyangthaphu-Birwa, 1100–2400 m (Nov. 27, 1963, fl.).

Distr. India, Burma, Indo-China, S. China, Formosa, and Philippines.

Microcarpaea minima (Koenig) Merrill in Philip. Journ. Sci. **7**: 100 (1912).

Paederota minima Koenig in Retz., Observ. Bot. **5**: 10 (1789).

Microcarpaea muscosa R. Brown, Prodr. Fl. Nov. Holl. **1**: 436 (1810)-Fl. Brit. Ind. **4**: 287 (1884).

Kathmandu Airport, 1400 m (Oct. 13, 1963); Sibganja–Mahara Bahara, 200 m (Dec. 12, 1963); Bharomdin–Tharpu, 1000–1200 m (Nov. 25, 1963); Tharpu–Chyangthaphu, 1200–1100 m (Nov. 26, 1963).

Distr. In rice paddies of India, Burma, Indo-China, Malaya, Philippines, tropical Australia, S. China, and Japan.

Mimulus nepalensis Bentham, Scroph. Ind. 29 (1835)-Fl. Brit. Ind. **4**: 258 (1884)-Grant in Ann. Miss. Bot. Gard. **11**: 99 (1924)-Yamazaki in Journ. Jap. Bot. **37**: 267 (1962).

Mimulus assamicus Griff. in Linnaea **12**: litt. 199 (1836).

Mimulus tenellus Bunge sensu Handel-Mazzetti, Symb. Sin. **7**: 832 (1936), p.p.-Kitamura in Faun. & Fl. Nepal Himal. **1**: 218 (1955).

Kurseong, 1700 m (Apr. 12, 1960, fl.); Rayang, 250 m (Apr. 20, 1960, fl.); Simkuna Bazar, 2200 m (Jun. 14, 1960, fl.); Rabong La-Temi, lower road, 1200 m (Mar. 28, 1963, fl. yellow); Sinduwa, Dhankuta Dist., 2100 m (Oct. 24, 1963, fl.); Taplejung–Garhi Danra, 1700 m (Nov. 23, 1963, fl.); Murhay–Bilbatay Bhanjang, 2000–2200 m (Oct. 24, 1963, fl. yellow).

Distr. C. & E. Himalaya (Nepal to Bhutan), Assam, and W. & C. China (Yunnan, Szechuan, Hupeh).

Mimulus szechuanensis Pai in Contr. Inst. Nat. Acad. Peiping **2**: 119 et 189 (1934)-Yamazaki, l.c. **37**: 265 (1962).

M. nepalensis Bentham var. 2, Fl. Brit. Ind. **4**: 259 (1884).

M. nepalensis Bentham var. *major* H. Winkl. in Fedde, Rep. Beih. **12**: 480 (1922).

M. tenellus Bunge var. *major* (Winkl.) Handel-Mazzetti, l.c. 833 (1936).

Mani Bhanjang–Batasi, 2000 m (May 1, 1960); Simkuna Bazar, 2200 m (Jun. 19, 1960); Mai Majuwa–Dhara Pani, 1800–1500 m (Dec. 4, 1963); Birwa–Yektin, 2400–1400 m (Nov. 28, 1963, fl.); Murhay, Dhankuta Distr., 2000 m (Oct. 24, 1963, fl.).

Distr. Himalaya (Nepal to Bhutan), and China (Yunnan, Szechuan, Shensi).

Lancea tibetica Hooker f. et Thoms. in Hook. Journ. Bot. **9**: 244, t. 7 (1857)-Fl. Brit. Ind. **4**: 260 (1884).

Jongri–Olothang, 3700 m (May 23, 1960, fl.).

Distr. Alpine Himalaya (Kashmir to Sikkim), and W. Tibet.

Oreosolen Wattii Hooker f., Fl. Brit. Ind. **4**: 318 (1884); Hooker, Icon. Pl. **23**: t. 2271 (1893).

Jongri–Olothang, 4000–3600 m (May 23, 1960, fl. yellow)

Distr. E. Himalaya (Nepal, Sikkim).

Pedicularis brevifolia D. Don, Prodr. Fl. Nepal. 94 (1825)-Pennell, l.c. 127 (1943).

Sandakphu–Garibans, 3400 m (Sep. 17, 1964, fl.).

Distr. Himalaya (Hazara to Sikkim).

Pedicularis Clarkei Hooker f., Fl. Brit. Ind. **4**: 310 (1884)–Prain, l.c. 161, pl. 11 a (1891).

Migothang–Nayathang, 3300 m (Jun. 1, 1960).

Distr. E. Himalaya (Nepal to Bhutan) and SE. Tibet.

Pedicularis gracilis Wall. ex Bentham, Scroph. Ind. 52 (1835)–Prain, l.c. 137 (1891)–Pennell, l.c. 131 (1943).

Tharpu–Khunga Chuli, 1200–2700 m (Nov. 27, 1963).

Distr. Himalaya (Hazara to Bhutan), and S. Tibet.

Pedicularis mollis Wall. ex Bentham, Scroph. Ind. 53 (1835)–Prain, l.c. 176, pl. 29 (1891).

Jongri–Gamothang, 4000 m (May 26, 1960).

Distr. Himalaya (Bashar to Bhutan).

Pedicularis Pantlingii Prain in Journ. Asia. Soc. Beng. **58** (2): 273 (1889)–Prain, l.c. 148, pl. 16 b (1891)–Tsoong, l.c. p. 141, t. 28 (1963).

P. furfuracea Wall. var. *integrifolia* Hooker f., Fl. Brit. Ind. **4**: 316 (1884).

Phalut, 3500 m (Jun. 5, 1960).

Distr. E. Himalaya (Sikkim, Bhutan), and southern Tibet.

Picrorhiza scrophulariaeflora Pennell in Acad. Nat. Sci. Philad. Monogr. **5**: 65 (1943)–Yamazaki in Faun. & Fl. Nepal Himal. 224 (1955).

Preig Chu–Jongri, 2200–4000 m (May 19, 1960); along the Choktsering Chu, north of Jongri, 4000–4200 m (May 21, 1960); Jongri–Olothang, 3900 m (May 23, 1960); Gamothang, 3800 m (May 27, 1960).

Distr. E. Himalaya (Nepal, Sikkim).

Scoparia dulcis L., Sp. Pl. ed. 1, 116 (1753)–Fl. Brit. Ind. **4**: 289 (1884); Pennell, l.c. 22 (1943).

Rangpo, 350 m (Jun. 13, 1960); Rayang, 250 m (Apr. 21, 1960); Biratnagar, 200 m (Oct. 14, 1963); Dhara Pani–Dhankuta, 300–1200 m (Oct. 17, 1963); Mul Pokhari–Dumhan, 2400–700 m (Oct. 30, 1963); Dumhan, Tamur River, 700 m (Oct. 31, 1963); near Chyangthaphu–Birwa, 1300–2400 m (Nov. 27, 1963); Yektin, 1400 m (Nov. 28, 1963, fl. light green).

Distr. Common in the tropics.

Scrophularia elatior Bentham, Scroph. Ind. 18 (1835); in DC., Prodr. **10**: 304 (1846)–Fl. Brit. Ind. **4**: 255 (1884).

Khebang–below Siling Tzokupa, 1700–2100 m (Nov. 20, 1963,); Selap–Walunchung Gola, 2600–3500 m (Nov. 10, 1963).

Distr. E. Himalaya (Nepal, Sikkim.).

Scrophularia pauciflora Bentham, Scroph. Ind. 17 (1835); in DC., Prodr. **10**: 302 (1846)–Fl. Brit. Ind. **4**: 253 (1884), p.p.–Yamazaki in Journ. Jap. Bot. **37**: 264, f. 1, 3–4 (1962).

Bilbatay Bhanjang–Tinjuray, 2200–2900 m (Oct. 27, 1963); Minchin Dhap-Mul Pokhari, 2800–2400 m (Oct. 29, 1963).

Distr. Himalaya (C. & E. Nepal).

Scrophularia sikkimensis Yamazaki in Journ. Jap. Bot. **37**: 263, f. 1, 1–2 (1962).

Jongri, 4000 m (May 21, 1960); Choktserling Chu-Jongri, 4000 m (May 25, 1960); Jongri-Gamothang, 3800 m (May 26, 1960); Gamothang, 3750 m (May 29, 1960); Phalut, 3500 m (Jun. 5, 1960); Sandakphu, 3600 m (Sep. 16, 1964).

Distr. E. Himalaya (Sikkim).

Scrophularia urticaefolia Wall. ex Bentham, Scroph. Ind. 18 (1835); in DC., Prodr. **10**: 306 (1846)-Fl. Brit. Ind. **4**: 254 (1884)-Stiefelhagen in Engl., Bot. Jahrb. **44**: 459 (1910)-Li in Lloydia **16**: 168 (1953).

Yoksam-Bakkim, 2200 m (May 18, 1960); Sandakphu-Garibans, 3000 m (Jun. 7, 1960, fl. green); Kakani, 2100–2200 m (Sep. 24, 1963, fl. greenish yellow); Sinduwa, 2100 m (Oct. 24, 1963); Bilbatay Bhanjang, 2200 m (Oct. 26, 1963); Bilbatay Bhanjang-Hati Sar, 2200–2700 m (Oct. 27, 1963); Hati Sar–Minchin Dhap, 2700–2800 m (Oct. 28, 1963); Minchin Dhap–Mul Pokhari, 2800–2400 m (Oct. 29, 1963); Thakma Khola-Bhandukay, 3200–2400 m (Nov. 14, 1963); Ghatte, 1300 m (Nov. 17, 1963); Ghatte-Khebang (Nov. 19, 1963); below Siling Tzokupa, 2100 m (Nov. 21, 1963); Batasay-Bhuspate Danra, 2400–2900 m (Dec. 1, 1963).

Distr. E. Himalaya (Nepal, Sikkim), and W. China (Yunnan).

Torenia cordata (Griff.) Dutta in Bull. Bot. Soc. Beng. **19**: 25 (1965).

Treisteria cordata Griff., Notul. **4**: 190 (1854).

Torenia asiatica L. sensu Hooker f., l.c. **4**: 277 (1884), p.p.

Gangtok, 1600 m (Jun. 15, 1960); Penlong La, Gangtok, 2100 m (Jun. 16, 1960); Godavari, near Kathmandu, 1500 m (Sep. 18, 1963); Taplejung, 1700 m (Nov. 2, 1963); Taplejung-Garhi Danra, 2000–2200 m (Nov. 3, 1963); Yektin-Akasay, 1400–2300 m (Nov. 30, 1963); Mai Majuwa-Dhara Pani, 1600–1500 m (Dec. 4, 1963); Darjeeling, 2150 m (Sep. 10, 1964, fl. violet); Namli, below Gangtok, 900 m (Sep. 12, 1964, fl. violet); Penlong La, 2100 m (Sep. 13, 1964).

Distr. E. Himalaya, and E. India.

Torenia cordifolia Roxb., Pl. Corom. **2**: 52, t. 161 (1798)-Bot. Mag. t. 3715 (1840)-Fl. Brit. Ind. **4**: 276 (1884)-Pennell, l.c. 32 (1943).

Helok, 1500 m (Nov. 7, 1963), Phusri-Dhara Pani, 450–900 m (Oct. 16, 1963), Dhara Pani-Dhankuta, 900–1200 m (Oct. 17, 1963); Kathmandu Airport, 1400 m (Oct. 13, 1963).

Distr. Himalaya, India, Indo-China, and W. China.

Torenia diffusa D. Don, Prodr. Fl. Nepal. 86 (1825).

Torenia vagans Roxb. [Hort. Beng. 95 (1814), nom. nud.] Fl. Ind. ed. 2, **3**: 96 (1832)-Fl. Brit. Ind. **4**: 277 (1884).

Siliguri–Kurseong, 1600–1700 m (Apr. 29, 1960).

Distr. C. & E. Himalaya, Indo-China and SW. China.

Torenia Thouarsii (Cham. et Schl.) O. Kuntze, Rev. Gen. Pl. **2**: 468 (1891)-Dutta, l.c. 24 (1965).

Nortenia Thouarsii Cham. et Schl. in Linnaea **3**: 18 (1828).

T. parviflora Ham. ex Bentham, Scroph. Ind. 39 (1835)-Fl. Brit. Ind. **4**: 278 (1884).

Rayang, along the river Tista, 250 m (Apr. 20, 1960).

Distr. Himalaya, India, Java, Malaya, Indo-China, and southern China.

Torenia violacea (Azaola ex Blanco) Pennell in Journ. Arn Arb. **24**: 255 (1943)-Yamazaki in Journ. Jap. Bot. **30**: 361 (1955).

Mimulus violaceus Azaola ex Blanco, Fl. Philip. ed. 2, 357 (1845).

Torenia peduncularis Bentham [in Wall. Cat. no. 3956 (1831) nom. nud.] ex Hooker f., Fl. Brit. Ind. **4**: 276 (1884).

T. edentula Griff. sensu Bentham in DC., Prodr. **10**: 410 (1846)-Bot. Mag. t. 4229 (1846).

Namli, below Gangtok, 900 m (Sep. 12, 1964).

Distr. C. & E. Himalaya, and SW. China.

Vandellia Anagallis (Burman) Yamazaki in Journ. Jap. Bot. **30**: 176 (1955). var. **verbenaefolia** (Colsm.) Yamazaki, l.c. 176 (1955).

Gratiola verbenaefolia Colsmann, Prodr. Descr. Gratiola **1**: 8 (1739).

Bonnaya verbenaefolia (Colsm.) Sprengel, Syst. Veg. **1**: 42 (1825).

Bonnaya veronicaefolia Sprengel var. *verbenaefolia* (Colsm.) Hooker f., Fl. Brit. Ind. **4**: 285 (1884).

Vandellia verbenaefolia (Colsm.) Haines, Bot. Bihar Orissa **4**: 634 (1922).

Lindernia verbenaefolia (Colsm.) Pennell in Journ. Arn. Arb. **24**: 252 (1943).

Godavari, Kathmandu, 1500 m (Sep. 18, 1963); Kathmandu, 1400 m (Oct. 13, 1963); Phusri–Dhara Pani 450–900 m (Oct. 16, 1963); Mul Pokhari–Dumhan, 2400–700 m (Oct. 30, 1963, fl. whitish); Dumhan, by the Tamur river, 700 m (Oct. 31, 1963); Dumhan–Taplejung, 700–2000 m (Nov. 1, 1963); Bharomdin–Tharpu, 1000–1200 m (Nov. 25, 1963); Sibganja–Mahara Bahara, 200 m (Dec. 12, 1963, fl. violet); Mahara Bahara–Kathgara, 200 m (Dec. 13, 1963); Gauriganja–Rangali, 200 m (Dec. 13, 1963).

Distr. India, Burma, Indo-China, C. & S. China, Formosa, Japan and Micronesia.

Vandellia angustifolia Bentham, Scroph. Ind. 37 (1835); in DC., Prodr. **10**: 417 (1846)–Fl. Brit. Ind. **4**: 282 (1884)

Lindernia angustifolia (Bentham) Wettstein in Engl., Pfl.-fam. IV, **3b**: 79 (1895).

Sibganja–Gauriganja, 200 m (Dec. 12, 1963).

Distr. India, Burma, Java, Malaya, Indo-China, C. & S. China, Formosa, Japan, and Korea.

Vandellia antipoda (L.) Yamazaki in Journ. Jap. Bot. **30**: 177 (1955).

Ruellia antipoda L., Sp. Pl. ed. 1, 635 (1753).

Gratiola veronicaefolia Retz., Observ. Bot. **4**: 8 (1786).

Gratiola ruelloides Colsm., Prodr. Descr. Gratiola, **1**: 12 (1793).

Gratiola reptans Roxb., Fl. Ind. ed. Carey, **1**: 140 (1820).

Bonnaya reptans (Roxb.) Sprengel, Syst. Veg. **1**: 41 (1825)-Fl. Brit. Ind. **4**: 284 (1884).

Bonnaya veronicaefolia (Retz.) Sprengel, l.c. 41 (1825).

Bonnaya ruellioides (Colsm.) Sprengel, l.c. 41 (1825).

Ilysanthes reptans (Roxb.) Urban in Ber. Deuts. Bot. Ges. **2**: 436 (1884).

Ilysanthes ruellioides (Colsm.) O. Kuntze, Rev. Gen. Pl. 462 (1891).

Lindernia antipoda (L.) Alston in Trimen, Hand-Book Fl. Ceylon **6**: 214 (1931).

Lindernia ruellioides (Colsm.) Pennell in Brittonia **2**: 182 (1936)–Mukerjee in Journ. Ind. Bot. Soc. **24**: 133 (1945).

Gangtok, 1600 m (Jun. 15, 1960); Tingling Bridge, 1000 m (May 16, 1960); Takdah, 1800 m (Apr. 18, 1960); Illam–Ranga Pani, 1200–700 m (Dec. 8, 1963); Ghorwa–Sanichare, 300–200 m (Dec. 10, 1963).

Distr. Tropical south-eastern Asia from India to S. China, Formosa, Ryukyu, Philippines, and New Guinea.

Vandellia ciliata (Colsm.) Yamazaki in Journ. Jap. Bot. **30**: 176 (1955).

Gratiola ciliata Colsm., l.c. 14 (1793).

Bonnaya brachiata Link et Otto, Icon. Pl. Select. Berol. **1**: 25 (1820)-Fl. Brit. Ind. **4**: 284 (1884).

Gratiola serrata Roxb., Fl. Ind. ed. Carey **1**: 139 (1820).

Ilysanthes serrata (Roxb.) Urban, l.c. 436 (1884).

Vandellia brachiata (Link et Otto) Haines, l.c. 632 (1922).

Lindernia ciliata (Colsm) Pennell in Brittonia **2**: 182 (1936).

Gokarna Forest, Kathmandu, 1500 m (Sep. 22, 1963); Mul Pokhari–Dumhan, 2400–700 m (Oct. 30, 1963); Dumhan, by the Tamur river, 700m (Oct. 31, 1963); Bharomdin–Tharpu, 1000–1200 m (Nov. 25, 1963); Tharpu, near Chyangthaphu, 1200 m (Nov. 26, 1963); Chyangthaphu–Birwa, 1200–2400 m (Nov. 27, 1963); Khebang–Bharomdin, 1700–1000 m (Nov. 24, 1963).

Distr. Tropical south-eastern Asia from India to S. China and Formosa, Java, Philippines, and New-Guinea.

Vandellia cordifolia (Colsm.) G. Don, Gen. Hist. **4**: 549 (1838).

Gratiola cordifolia Colsm., l.c. 15 (1793).

V. pedunculata Bentham, Scroph. Ind. 37 (1835)-Fl. Brit. Ind. **4**: 282 (1884).

Lindernia cordifolia (Colsm.) Merrill, Enum. Philip. Pl. **3**: 437 (1923)-Mukerjee, l.c. 132 (1945).

Rangpo–Tista, 450 m (Jun. 18, 1960).

Distr. India, Ceylon, Java, Philippines, Borneo, Malay, Indo-China, southern S. China, Formosa, Ryukyu, and Kyushu.

Vandellia crustacea (L.) Bentham, Scroph. Ind. 35 (1835)-Fl. Brit. Ind. **4**: 279 (1884).

Capraria crustacea L., Mant. Pl. **1**: 87 (1767).

Torenia crustacea (L.) Chamisso et Schlecht. in Linnaea **2**: 570 (1827).

Lindernia crustacea (L.) F. von Müller, Syst. Census. Austr. Pl. **1**: 97 (1882).

Kathmandu, 1400 m (Sep. 17, 1963); Kathmandu Airport, 1400 m (Oct. 13, 1963); Dhankuta, 1200 m (Oct. 20, 1963); Dumhan, Taplejung Dist., 700 m (Oct. 31, 1963).

Distr. Throughout tropics of the Old World, principally from India to tropical eastern Asia up to central Japan.

Vandellia mollis Bentham, Scroph. Ind. 37 (1835)-Fl. Brit. Ind. **4**: 281 (1884).

Lindernia mollis (Bentham) Wettstein in Engl., Pfl.-fam. IV, **3b**: 79 (1895)-Mukerjee, l.c. 131 (1945).

Rangpo–Tista, 400 m (Jun. 18, 1960).

Distr. Sikkim, Assam, Bengal, Burma, Malaya, Indo-China, and S. China.

Vandellia nummularifolia D. Don, Prodr. Fl. Nepal. 86 (1825)-Fl. Brit. Ind. **4**: 282 (1884).

Lindernia nummularifolia (Don) Wettst. in Engl., Pfl.-fam. IV, **3b**: 79 (1895)-Mukerjee, l.c. 132 (1945).

Vandellia chinensis Yamazaki in Journ. Jap. Bot. **30**: 178 (1955), syn. nov.

Gangtok 1600 m (Jun. 15, 1960); Pouwa, Kathmandu, 1600 m (Oct. 9, 1963); Dhankuta, 1200 m (Oct. 21, 1693); Dhankuta–Hilay, 1200–1800 m (Oct. 23, 1963).

Distr. Himalaya, India, Burma, and C. China.

Vandellia oppositifolia (L.) Haines, Bot. Bihar Orissa **4**: 634 (1922).

Gratiola oppositifolia L. ex Willd., Sp. Pl. **1**: 105 (1797).

Bonnaya oppositifolia (L.) Sprengel, Syst. Veg. **1**: 41 (1825)–Fl. Brit. Ind. **4**: 286 (1884).

Lindernia oppositifolia (L.) Mukerjee in Journ. Ind. Bot. Soc. **24**: 132 (1945).

Sibganja–Mahara Bahara, 200 m (Dec. 12, 1963); Sibganja–Gauriganja, 200 m (Dec. 12, 1963); Gauriganja–Rangali, 200 m (Dec. 13, 1963); Kathmandu Airport, 1400 m (Oct. 13, 1963); Kathmandu–Tankot, 1300 m (Sep. 19, 1963).

Distr. Himalaya, India, and Indo-China.

Vandellia pusilla (Willd.) Yamazaki, comb. nov.

Gratiola pusilla Willdenow, Sp. Pl. **1**: 105 (1797).

Torenia hirta Chamisso et Schlecht. in Linnaea **2**: 571 (1827).

Vandellia diffusa Blanco, Fl. Philip. ed. 3, t. 368 (1877–83).

Vandellia scabra Bentham, Scroph. Ind. 36 (1835)–Fl. Brit. Ind. **4**: 281 (1884).

Lindernia pusilla (Willd.) Schlechter in Bot. Janrb. **59**: 106 (1924).

L. hirta (Cham. et Schl.) Pennell, l.c. 250 (1943)–Mukerjee, l.c. 131; (1945).

Vandellia hirta (Cham. et Schl.) Yamazaki in Journ. Jap. Bot. **30**: 174 (1955).

Mul Pokhari–Dumhan, 2400–700 m (Oct. 30, 1963); Khebang, 1400 m (Nov. 23, 1963); Sibganja–Gauriganja, 200 m (Dec. 12, 1963).

Distr. Throughout tropics from Africa to India, Malaya, Philippines, and Polynesia.

Vandellia tenuifolia (Colsm.) Haines, Bot. Bihar Orissa **4**: 634 (1922)–Yamazaki in Journ. Jap. Bot. **30**: 175 (1955).

Gratiola tenuifolia Colsmann, Prodr. Descr. Gratiola **1**: 8 (1793).

Bonnaya tenuifolia (Colsm.) Sprengel, Syst. Veg. **1**: 42 (1825)–Fl. Brit. Ind. **4**: 286 (1884).

Lindernia tenuifolia (Colsm.) Alston in Trimen, Hand-Book Fl. Ceylon **6**: 214 (1931).

Bharomdin–Tharpu, 1000–1200 m (Nov. 25, 1963); Dumhan–Taplejung, 700–2000 m (Nov. 1, 1963); Tharpu–Chyangthaphu, 1200–1100 m (Nov. 26, 1963).

Distr. India, Ceylon, Burma, Indo-China, S. China, Java, Formosa, and Ryukyu.

Veronica cana Wall. ex Bentham, Scroph. Ind. 45 (1835)–Fl. Brit. Ind. **4**: 295 (1884)–Yamazaki in Journ. Jap. Bot. **31**: 296 (1956).

Nayathang–Chia Bhanjang, 3200 m (Jun. 2, 1960); Bilbatay Bhanjang–Hati Sar, 2200–2700 m (Oct. 27, 1963); Hati Sar–Minchin Dhap, 2700–2800 m (Oct. 28, 1963); Minchin Dhap–Mul Pokhari, 2800–2400 m (Oct. 29, 1963); Diorali Bhanjang–Bhandukay, 3500–2700 m (Nov. 14, 1963); Thakma Khola–Yamphodin, 3300–2100 m (Nov. 17, 1963); below Siling Tzokupa, 2100 m (Nov. 21, 1963).

Distr. Himalaya (Kashmir to Sikkim).

Veronica javanica Blume, Bijdr. 742 (1826)–Fl. Brit. Ind. **4**: 296 (1884)–Pennell, l.c. 296 (1943).

Happy Valley, Darjeeling, 1900 m (Apr. 10, 1960); Kurseong, 1550 m (Apr. 12, 1960); Tingling Bridge–Yoksam, 1000–1700 m (May 16, 1960); Yoksam–Bakkim (May 18, 1960); Gangtok, 1650 m (Mar. 23, 1963, fl. white); Kathmandu Airport, 1400 m (Oct. 13, 1963); Dhankuta, 1200 m (Oct. 21, 1963); Bhuspate Danra, 2600 m (Dec. 2, 1963).

Distr. Widespread weed in tropical Asia.

Veronica robusta (Prain) Yamazaki in Journ. Jap. Bot. **37**: 263 (1962).

V. cana Wall. var. *robusta* Prain in Journ. Asia. Soc. Beng. **72**: 20 (1903)–Dutta in Journ. Bombay Nat. Hist. Soc. **57**: 593, pl. (1960).

Garibans–Tonglu, 2800 m (Jun. 7, 1960); Thakma Khola, 3000 m (Nov. 13, 1963); Thakma Khola–Yamphodin, 3300–2100 m (Nov. 17, 1963).

Distr. E. Himalaya (Nepal, Sikkim).

Veronica serpyllifolia L., Sp. Pl. ed. 1, 12 (1753)-Pennell, l. c. 77 (1943).

Happy Valley, Darjeeling, 1900 m (Apr. 7, 1960) ; Senchal, 2400 m (Apr. 17, 1960); Senchal-Tiger Hill, 2400-2500 m (Jun. 23, 1960).

Distr. Waysides and fields, naturalized from Europe.

Veronica umbelliformis Pennell in Acad. Nat. Sci. Philad. Monogr. **5**: 87 (1943).

Nayathang–Chia Bhanjang, 3200 m (Jun. 2, 1960); Phalut–Sandakphu, 2800 m (Jun. 6, 1960); Sandakphu, 3600 m (Sep. 16, 1964).

Distr. Himalaya (Kumaon to Sikkim).

Wightia speciosissima (D. Don) Merrill in Journ. Arn. Arb. **19** : 67 (1938)-van Steenis in Bull. Bot. Gard. Buitenz. ser. 3, **18** : 224 (1949)-Maheshwari in Bull. Bot. Surv. Ind. **3** : 32, fig. (1962).

Gmelina speciosissima D. Don, Prodr. Fl. Nepal. 104 (1825).

Wightia gigantea Wallich, Pl. Asia. Rar. **1** : 71, t. 81 (1830)-Fl. Brit. Ind. **4**: 257 (1884).

Above Helok, 1700 m (Nov. 9, 1963, epiphyte, fl. rose-purple); above Lelep, 2600 m (Nov. 9, 1963); Ghatte, 1600 m (Nov. 17, 1963, fl. deep rose); Ghatte–Khebang, 1600–1700 m (Nov. 19, 1963); near Chyangthaphu, 1200 m (Nov. 27, 1963, epiphyte, fl. purple).

Distr. Himalaya (Nepal to Bhutan), Khasia, Manipur, N. Burma, Indo-China, and W. China (Yunnan).

BIGNONIACEAE (by Takasi Yamazaki)

Oroxylum indicum (L.) Vent., Dec. Gen. Nov. 8 (1808)–Fl. Brit. Ind. **4**: 378 (1884).

Bignonia indica L., Sp. Pl. ed. 1, 625 (1753).

Tista, 350 m (Jun. 20, 1960, fr.); Bharomdin–Tharpu, 1000–1200 m (Nov. 25, 1963); Ranga Pani–Chisa Pani, 600 m (Dec. 9, 1963, fr.).

Distr. India to Indo-China, Malaya, Java, and Philippines.

Stereospermum suaveolens (Roxb.) DC., Prodr. **9**: 211 (1845)–Fl. Brit. Ind. **4**: 382 (1884).

Bignonia suaveolens Roxb., Fl. Ind. ed. 2, **3**: 382 (1832).

Sibganja–Mahara Bahara, 200 m (Dec. 12, 1963, fr.).

Distr. India, and Ceylon.

OROBANCHACEAE (by Takasi Tuyama)

Aeginetia indica L., Sp. Pl. ed. 1, 632 (1753)–Hook. f., Fl. Brit. Ind. **4**: 320 (1884)–Hara, Enum. Sperm. Jap. **1**: 286 (1949)–Backer, Fl. Jav. **2**: 516 (1965).

Gangtok, 1600 m (Jan. 17, 1960); Taplethok–Helok, 1400–1500 m (Nov. 6, 1963); Ghatte–Khebang, 1600–2400 m (Nov. 19, 1963); Khebang–Siling Tzokupa, 1700–2100 m (Nov. 20 & 22, 1963); Khebang, 1400 m (Nov. 23, 1963); Chyangthaphu–Birwa, 1300–2400 m (Nov. 27, 1963); Ranga Pani–Ghorwa, 700–300 m (Dec. 9, 1963).

Distr. Himalaya (Kumaon to Sikkim), Assam, Khasia, throughout India, Ceylon, Burma, Indo-China, China, Japan, Philippines, and Malay Archipelago.

Boschniakia himalaica Hooker f. et Thomson in Fl. Brit. Ind. **4**: 327 (1884)–Forbes et Hemsley in Journ. Linn. Soc. **26**: 221 (1890)–Hand.-Mzt., Symb. Sin. **7** (4): 875 (1936).

Xylanche himalaica (Hook. f. et Thoms.) G. Beck, Monogr. Orob. 58 (1890); in Pfl.-reich IV–261, Ht. **96**: 330 et 331, fig. 24, H–L (1930)–H. Smith in Act. Hort. Gothob. **8**: 139, fig. 5, a-k (1933)–Spring Fl. Sikkim Himal. 27, f. 50–51 (1963).

Boschniakia Kawakamii Hayata, Icon. Pl. Formos. **4**: 19 (1914), syn. nov.

Jongri, 4100 m (May 20 et 24, 1960); Jongri–Olothang (Preig Chu), 3900–4000 m (May 23, 1960, no. 464); Gamothang, 3800–4000 m (May 26, 1960); Phalut–Sandakphu, 3500–3800 m (Jun. 6, 1960).

Distr. Subalpine Himalaya (Garhwal to NEFA), China (Szechuan, Yunnan, Hupeh), and Formosa.

The species was found growing on roots of *Rhododendron lanatum* on the mountain slope of Jongri and Olothang. The capsular valves in this plant are as a rule three in number, but the fruits with two valves are often found even in the same scape. The similar facts are also found in *B. Kawakamii* from Formosa which is also parasitic on the root of *Rhododendron* sp. Accordingly, the number of valves (or placentas) can not be emphasized as G. Beck had done when he established a new genus, *Xylanche*, based on these plants. Concerning *B. himalaica*, J. D. Hooker himself stated that the capsule is 'irregularly 2–3-valved.' In the original description of *B. Kawakamii* by B. Hayata, he stated that the Formosan plant is different from Himalayan by having 'very short fruiting pedicels attaining 2 mm in length (in Himalayan plant it is 1/2 inch long).' Actually, however, some capsules of Formosan plants have the pedicels up to 8 mm or longer, becoming shorter in the upper portion of the scape. By irregular prolification, some of the Himalayan plants have the pedicels up to 2 cm, but as a rule they range between 2–10 mm. I could not find out any glandular hairs on the calyx limbs of *B. Kawakamii* which Hayata took distinctive to his species. Although we have not yet seen the flowering specimen from Formosa, *B. Kawakamii* should be regarded as synonymous to *B. himalaica*.

MARTYNIACEAE (by Takasi Yamazaki)

Martynia diandra Gloxin, Obs. Bot. t. 1 (1785)–Haines, Bot. Bihar Orissa **4**: 662 (1922).

Dhara Pani–Dhankuta, 900–1200 m (Oct. 17, 1963, fl. & fr.).

Distr. A native of Mexico; naturalized in India.

GESNERIACEAE (by Hiroshi Hara)

Aeschynanthus gracilis Parish ex C. B. Clarke, Comm. et Cyrt. Beng. 75, t. 48 A (1874)–Fl. Brit. Ind. **4**: 340 (1884).

Ratong Chu, below Tingling, 1000 m (May 15, 1960, fr.); Saramsa, 1100 m (Mar. 21, 1963, fl.); Middle Camp, between Singtam and Gangtok, 700 m (Mar. 29, 1963, fl.).

Distr. E. Himalaya (Sikkim, Bhutan), Khasia, Manipur, and Burma.

Aeschynanthus Hookeri C. B. Clarke in DC., Monogr. Phaner. **5**: 21 (1883)–Fl. Brit. Ind. **4**: 338 (1884).

Phalut–Dentam, 1500–2000 m (May 11, 1960, fl.).

Distr. E. Himalaya (Sikkim).

Aeschynanthus parviflorus (D. Don) Sprengel, Syst. Veg. **4** (2): 238 (1827).

Trichosporum parviflorum D. Don in Edinb. Philos. Journ. **7**: 85 (1822); Prodr. Fl. Nepal. 125 (1825).

A. ramosissima Wallich, Pl. Asia. Rar. **1**: 55, t. 71 (1829)–Fl. Brit. Ind. **4**: 339 (1884).

Sunderijal Waterfall, Kathmandu, 1600 m (Sep. 20, 1963, fl.).

Distr. Himalaya (Kumaon to Sikkim).

Aeschynanthus sikkimensis (Clarke) Stapf in Bot. Mag. t. 8938 (1922)–Spring Fl. Sikkim Himal. f. 176 (1963).

A. maculatus var. *β sikkimensis* C. B. Clarke in DC., Monogr. Phaner. **5**: 24 (1883).

A. maculatus Lindley sensu Fl. Brit. Ind. **4**: 339 (1884), p.p.

Darjeeling, 2000 m (Apr. 10, 1963, fr.); Batasi, 2000 m (May 2, 1963, fl.); Ramam, 2400 m (May 9, 1960, fl.); Chia Bhanjang–Dentam, 2000 m (May 11, 1960, fl.); Tingling Bridge, 1000 m (May 16, 1960, fl.); Yoksam, 1700 m (May 17, 1960, fl.); Sinduwa, 2100 m (Oct. 23, 1963, fr.); Tuwa–Taplethok, 1800–1400 m (Nov. 5, 1963, fr.); Ghatte–Khebang, 1600–2400 m (Nov. 19, 1963, fr.); Chyangthaphu, 1300 m (Nov. 27, 1963, fr.).

Distr. E. Himalaya (E. Nepal to Bhutan), and Khasia.

The shape and size of leaves are considerably variable, and it is difficult to identify with certainty some fruiting specimens belonging to Sect. Diplotrichium.

Briggsia Kurzii (Clarke) W. E. Evans in Not. Bot. Gard. Edinb. **16**: 133 (1928).

Didymocarpus Kurzii C. B. Clarke, Comm. et Cyrt. Beng. 96, t. 66 (1874).

Chirita Kurzii (Clarke) C. B. Clarke in Journ. Linn. Soc. **15**: 145 (1876)–Fl. Brit. Ind. **4**: 358 (1884).

Gatribas, 2800 m (Sep. 17, 1964, fr.).

Distr. E. Himalaya (Nepal, Sikkim), and N. Burma.

Chirita macrophylla Wallich, Pl. Asia. Rar. **1**: 56, t. 72 (1829)–Fl. Brit. Ind. **4**: 358 (1884).

Birch Hill, Darjeeling, 2000 m (Jun. 18, 1960, bud); Sinduwa, 2100 m (Oct. 24, 1963, fr.).

Distr. E. Himalaya (Nepal to Bhutan).

Chirita primulacea C. B. Clarke, Comm. et Cyrt. Beng. 114, t. 82 (1874)–Fl. Brit. Ind. **4**: 360 (1884).

Takdah–Rayang, 1000 m (Apr. 20, 1960, no. 2185, fl.).

Distr. E. Himalaya (Sikkim).

Chirita pumila D. Don, Prodr. Fl. Nepal. 90 (1825)–Fl. Brit. Ind. **4**: 357 (1884).

Taplejung, 1700 m (Nov. 2, 1963, fr.); Ghatte–Khebang, 1600–2400 m (Nov. 19, 1963, fr.); Darjeeling, 2170 m (Sep. 10, 1964, fl. mauve).

Distr. Himalaya (Simla to Bhutan), Khasia, Manipur, and N. Burma.

Chirita urticifolia Hamilton ex D. Don, Prodr. Fl. Nepal. 90 (1825)–Fl. Brit. Ind. **4**: 358 (1884).

C. grandiflora Wallich, Pl. Asia. Rar. **1**: 43, t. 50 (1829).

Kakani, 2100–2200 m (Sep. 24, 1963, fl.); Pouwa, Kathmandu, 1600 m (Oct. 9, 1963, fl.); Darjeeling, 2150 m (Sep. 10, 1964, fl.); Birwa–Yektin, 2000–1600 m (Nov. 28, 1963, fr.); Penlong La, 2100 m (Sep. 13, 1964, fl.).

Distr. E. Himalaya (Nepal to Bhutan).

Corallodiscus lanuginosus (DC.) Burtt in Gard. Chron. ser. 3, **122**: 212 (1947).

Didymocarpus lanuginosus Wall. ex DC., Prodr. **9**: 268 (1845).

Didissandra lanuginosa (DC.) C. B. Clarke in DC., Monogr. Phaner. **5**: 66 (1883); in Fl. Brit. Ind. **4**: 355 (1884).

Palmajua–Rimbick, 2300–2200 m (May 5, 1960, fr.); Sunderijal Waterfall, Kathmandu, 1600 m (Sep. 20, 1963, fr.); Tuwa–Taplethok, 1800–1400 m (Nov. 5, 1963, fr.).

Distr. Himalaya (Simla to Bhutan), and Khasia.

Didymocarpus albicalyx C. B. Clarke in DC., Monogr. Phaner. **5**: 78 (1883).

D. villosa DC. sensu C. B. Clarke, Comm. et Cyrt. Beng. 89, t. 59 (1874).

D. leucocalyx C. B. Clarke in Fl. Brit. Ind. **4**: 348 (1884).

Darjeeling, 1900–2150 m (Apr. 3, 1960, fr.; Sep. 15, 1964, fl.); Sanguri Bhanjang, 1200 m (Oct. 16, 1963, fr.); Iladanda–Helok, 1800–1500 m (Nov. 13, 1963, fr.).

Distr. E. Himalaya (Nepal, Sikkim).

Didymocarpus Andersoni C. B. Clarke, Comm. et Cyrt. Bengal. 92, t. 62 (1874)–Fl. Brit. Ind. **4**: 346 (1884).

Khebang–below Siling Tzokupa, 1700–2100 m (Nov. 20, 1963, fr.).

Distr. E. Himalaya (E. Nepal, Sikkim).

Didymocarpus podocarpus C. B. Clarke in DC., Monogr. Phaner. **5**: 76 (1883), ut *podocarpa*; in Fl. Brit. Ind. **4**: 347 (1884).

Darjeeling, 1900 m (Apr. 3, 1960, fr.); Takdah, 1600 m (Apr. 18, 1960, fr.); Batasi–Palmajua, 2000–2200 m (May 3, 1960, bud); Ghum–Kurseong, 2200–2000 m (Jun. 22, 1960, fr.); Sandakphu–Garibans, 3000–2800 m (Jun. 7, 1960, bud); Rimbick–Ramam, 1900–2400 m (May 7, 1963, fr.); Gangtok, 1650 m (Jun. 13, 1960, bud); above Tutay, 2500 m (Oct. 26, 1963, fr.).

Distr. E. Himalaya (E. Nepal, Sikkim).

Leptoboea multiflora (Clarke) Bentham ex Gamble, List Tr. Darjeel. 58 (1878), comb. nud.–C. B. Clarke in DC., Monogr. Phaner. **5**: 165 (1883); in Fl. Brit. Ind. **4**: 368 (1884).

Championia multiflora C. B. Clarke, Comm. et Cyrt. Beng. 99, t. 68 (1874).

Sanguri Bhanjang, 1000–1200 m (Oct. 16, 1963, fr.); Dumhan–Taplejung, 700–1900 m (Nov. 1, 1963, fr.); Tuwa–Taplethok, 1800–1400 m (Nov. 5, 1963, fr.); Khebang–

Bharomdin, 1700–1000 m (Nov. 24, 1963, fr.); Yektin, 1100 m (Nov. 29, 1963, fr.); Yektin–Akasay (Nov. 30, 1963, fr.); Illam–Ranga Pani, 1200–400 m (Dec. 8, 1963, fr.).

Distr. E. Himalaya (Nepal to Bhutan), and Khasia.

Loxostigma Griffithii (Wight) C. B. Clarke in DC., Monogr. Phaner. **5**: 60 (1883); in Fl. Brit. Ind. **4**: 344 (1884). [Pl. 5 a]

Didymocarpus Griffithii Wight, Ill. Ind. Bot. **2**: 182, t. 159 (1850).

Dichrotrichum Griffithii C. B. Clarke, Comm. et Cyrt. Beng. 79, t. 51 (1874).

Penlong La, 2100 m (Mar. 18, 1963, fr.); Damthang–Temi, 2200–1800 m (Mar. 25, 1963, fr.); below Siling Tzokupa, 2000 m (Nov. 20, 1963, fl.); Mai Majuwa–Mai Pokhari, 1600 m (Dec. 4, 1963, defl.); Birch Hill, Darjeeling, 2100 m (Dec. 28, 1963, fl.; Sep. 21, 1964, bud).

Distr. E. Himalaya (E. Nepal to Mishimi Hills), Khasia, and Manipur.

Lysionotus serrata D. Don in Edinb. Philos. Journ. **7**: 85 (1822); Prodr. Fl. Nepal. 124 (1825)–Fl. Brit. Ind. **4**: 344 (1884).

L. ternifolia Wallich, Pl. Asia. Rar. **2**: 20, t. 118 (1831).

Birch Hill, Darjeeling, 2100 m (Apr. 7, 1960); Kurseong, 1600 m (Apr. 12, 1960, fr.); Palmajua–Rimbick, 2300–2200 m (May 5, 1960, fr.); Rimbick, 2200 m (May 6, 1960, fr.); Gokarna, Kathmandu, 1500 m (Sep. 22, 1963, fl.); Bhandukay Bhanjang (Dec. 3, 1963, fr.).

Distr. Himalaya (Kumaon to NEFA), Khasia, Manipur, and N. Burma.

Rhynchoglossum obliquum Blume, Bijdr. 741 (Jun.–Dec. 1826), ut *Rhinchoglossum*–Fl. Brit. Ind. **4**: 367 (1884)–Burtt in Not. Bot. Gard. Edinb. **24**: 170 (1962).

Wulfenia obliqua Wall., Tent. Fl. Napal. 45, t. 35 (Aug., 1826).

Rhynchoglossum obliquum (Wall.) DC., Prodr. **9**: 275 (1845).

R. obliquum var. *β parviflora* C. B. Clarke in DC., Monogr. Phaner. **5**: 162 (1883); in Fl. Brit. Ind. **4**: 367 (1884).

Swayambhu Nath, Kathmandu, 1500 m (Sep. 23, 1963, fl.); Sanguri Bhanjang, 1200 m (Oct. 16 & 17, 1963, fl.); Tuwa–Taplethok, 1800–1400 m (Nov. 5, 1964, fr.); Helok–Iladanda, 1500–1800 m (Nov. 8, 1963, fr.); Zalipur, near Gangtok, 1000 m (Sep. 12, 1964, fl.).

Distr. Himalaya (Kumaon to NEFA), India, Ceylon, Burma, Malaysia, and W. & S. China.

Rhynchotechum ellipticum (Wall.) A. DC. in DC., Prodr. **9**: 285 (1846)–Fl. Brit. Ind. **4**: 373 (1884)–Burtt in Not. Bot. Gard. Edinb. **24**: 37 (1962).

Corysanthera elliptica Wall. ex D.F.N. Dietrich, Syn. Pl. **3**: 582 (1843).

Chisa Pani–Ghorwa, 700–300 m (Dec. 9, 1963); Ghorwa–Sanichare, 300–200 m (Dec. 10, 1963, fr.).

Distr. E. Himalaya (Nepal to Bhutan), and Khasia.

LENTIBULARIACEAE (by Hiroshi Hara)

Utricularia aurea Loureiro, Fl. Cochinch. **1**: 26 (1790)–Merrill in Trans. Amer. Philos. Soc. n. s. **24** (2): 356 (1935)–Tamura in Sci. Rep. Osaka Univ. **1**: 57 (1952).

U. flexuosa Vahl, Enum. **1**: 198 (1804)–Fl. Brit. Ind. **4**: 329 (1884).

U. pilosa Makino in Bot. Mag. Tokyo **11**: (70) (1897); **20**: 97 (1906).

Kathmandu, 1500m (Sep. 17, 1963, fl.); Sibganja-Gauriganja, 200m (Dec. 12 1963, fr.).

Distr. India, east to China, Formosa and Japan, and Australia.

Utricularia gibba L., Sp. Pl. ed. 1, **1**: 18 (1753).

subsp. **exoleta** (R. Br.) P. Taylor in Mitt. Bot. Staat. Münch. **4**: 101 (1961); in Kew Bull. **18**: 204 (1964).

U. exoleta R. Brown, Prodr. Fl. Nov. Holl. **1**: 430 (1810)–Hara, Enum. Sperm. Jap. **1**: 291 (1949).

Mai Pokhari, 1600m (Dec. 4, 1963, ster.).

Distr. Portugal, S. Asia, east to Japan, Malaysia, Australia, and Africa.

Utricularia scandens Benjamin in Linnaea **20**: 309 (1847)–P. Taylor in Kew Bull. **18**: 46, f. 8 & 9 (1964), subsp. *scandens*.

U. Wallichii Wight in Hooker, Journ. Bot. Kew Misc. **1**: 372 (1849).

U. Wallichiana (non Benjamin 1845) Wight, Icon. **4**: t. 1572, f. 1 (1850)–Fl. Brit. Ind. **4**: 332 (1884), cum var. *firmula* Oliver.

Gangtok, 1700 m (Jun. 18, 1960, fl.); Sunderijal Waterfall, 1600 m (Sep. 20, 1963, fl.); Bilbatay Bhanjang, 2200 m (Oct. 26, 1963, fl.).

Distr. Africa, India (Himalaya to Ceylon), and New Guinea.

Utricularia striatula Smith in Rees, Cyclop. 37, no. 17 (1819)–P. Taylor in Kew Bull. **18**: 91, f. 30 & 31 (1964).

U. orbiculata Wallich ex A. DC., Prodr. **8**: 18 (1844)–Fl. Brit. Ind. **4**: 334 (1884).

Sunderijal Waterfall, 1600 m (Sep. 20, 1963, fl.); Darjeeling, 2150 m (Sep. 10, 1964, fl.).

Distr. Africa, India, Malaysia, south to New Guinea, east to S. China, and Formosa.

The plants are very variable, and the three species, *U. brachiata*, *U. furcellata*, and *U. multicaulis* described by Oliver in 1859, may also fall within the variations of *U. striatula*.

ACANTHACEAE (by Takasi Yamazaki)

Adhatoda vasica Nees in Wall., Pl. Asia. Rar. **3**: 103 (1832)–C. B. Clarke in Fl. Brit. Ind. **4**: 540 (1885).

Justicia Adhatoda L., Sp. Pl. ed. 1, **1**: 15 (1753).

Phusri-Dhara Pani, 450–900 m (Oct. 16, 1963); Bharomdin-Tharpu, 1000–1200 m (Nov. 25, 1963); Dhara Pani-Illam, 1500–1200 m (Dec. 5, 1963); Illam-Ranga Pani, 1200–700 m (Dec. 8, 1963).

Distr. Throughout India, Indo-China, and Malaya.

Asystasia macrocarpa Nees in Wall., Pl. Asia. Rar. **3**: 89 (1832)–C. B. Clarke, l.c. 495 (1884).

Birch Hill, Darjeeling, 2060 m (Mar. 16, 1963 fl. purpulish with purple veins, whitish in the lower part); Damthang-Temi, 1800–2200 m (Mar. 25, 1963).

Distr. Subtropical Himalaya (Kumaon to Bhutan).

Barleria cristata L., Sp. Pl. ed. 1, **1**: 636 (1753)–C. B. Clarke, l.c. 488 (1884).

Barleria ciliata Roxb., Fl. Ind. ed. 2, **3**: 38 (1832).

Sunderijal Waterfall, near Kathmandu, 1600 m (Sep. 20, 1963); Dhara Pani-Tamur Bridge, 900–300 m (Oct. 17, 1963); Dhankuta, 1200 m (Oct. 18, 1963);

Dumhan-Taplejung, 800 m (Oct. 31, 1963).

Distr. Himalaya, India, Malaya, Indo-China, and S. China.

Barleria dichotoma Roxb., Fl. Ind. ed. 2, **3**: 39 (1832)-Nees in Wall., Pl. Asia. Rar. **3**: 91 (1832)-Haines, Bot. Bihar Orissa **4**: 683 (1922).

Godavari, Kathmandu, 1500 m (Sep. 18, 1963); Sunderijal, Kathmandu, 1500 m (Sep. 20, 1963); Kathmandu Airport, 1300 m (Oct. 13, 1963); Phusri-Dhara Pani, 450-900 m (Oct. 16, 1963); Dhara Pani-Dhankuta, 900-1200 m (Oct. 17, 1963); Dumhan-Taplejung, 700-2000 m (Nov. 1, 1963); Khebang-Bharomdin, 1700-1000 m (Nov. 24, 1963); Bharomdin-Tharpu, 1000-1200 m (Nov. 25, 1963); Yektin, 1100 m (Nov. 29, 1963); Dhara Pani-Illam, 1500-1200 m (Dec. 5, 1963).

Distr. Himalaya, India, Malaya, and Indo-China.

Barleria strigosa Willd., Sp. Pl. **3**: 379 (1800)-C. B. Clarke, l.c. 489(1884).

Barleria caerulea Roxb., Hort. Beng. 45 (1814), nom. nud.; Fl. Ind. ed. 2, **3**: (1832).

Phusri-Dhara Pani, 450-900 m (Oct. 16, 1963); Dhara Pani-Tamur Bridge, 900-300 m (Oct. 17, 1963); Ranga Pani-Ghorwa, 700-300 m (Dec. 9, 1963); Ghorwa-Sanichare, 300-200 m (Dec. 10, 1963).

Distr. E. Himalaya, E. India, Indo-China, and Burma.

Cardanthera triflora (Roxb.) Ham. ex C.B. Clarke in Fl. Brit. Ind. **4**: 405 (1884).

Ruellia triflora Roxb., Fl. Ind. ed. 2, **3**: 52 (1832).

Sibganja-Mahara Bahara, 200 m (Dec. 12, 1963); Kathgara-Rangali 200 m (Dec. 14, 1963).

Distr. E. Himalaya, E. India, and Assam.

Dicliptera bupleuroides Nees in Wall., Pl. Asia. Rar. **3**: 111 (1832)-Haines, Bot. Bihar Orissa **4**: 698 (1922).

Dicliptera Roxburghiana Nees var. *bupleuroides* (Nees) Clarke, l.c. 554 (1885).

Takdah, 1600-1700 m (Apr. 19, 1960); Phusri-Dhara Pani, 450-900 m (Oct. 16, 1963); Dhankuta, 1200 m (Oct. 21, 1963); Dumhan-Taplejung, 700 m (Oct. 31, 1963, fl. rose violet or white); Dumhan-Taplejung, 700-2000 m (Nov. 1, 1963); Tuwa-Taplethok (Nov. 5, 1963); Tharpu-Chyangthaphu, 1200 m (Nov. 26, 1963); Khebang-Bharomdin, 1700-1000 m (Nov. 24, 1963); Illam, 1200 m (Dec. 6, 1963); Ranga Pani-Ghorwa, 700-300 m (Dec. 9, 1963).

Distr. Afghanistan, and Himalaya (Kashmir to Sikkim).

Dicliptera Roxburghiana Nees in Wall., Pl. Asia. Rar. **3**: 111 (1832)-C. B. Clarke, l.c. 553 (1885).

Takdah, 1600 m (Apr. 19, 1960); Swayambhu, Kathmandu, 1500 m (Sep. 23, 1963); Kakani Hill, Kathmandu, 2200 m (Sep. 24, 1963); Phusri-Dhara Pani, 450-900 m (Oct. 16, 1963, fl. pinkish); Dhara Pani-Dhankuta, 900-1200 m (Oct. 17, 1963, fl. white); Hilay-Murhay, 1800-200 m (Oct. 23, 1963, fl. pinkish); Bilbatay Bhanjang, 2200 m (Oct. 26, 1963); Iladanda-Selap, 800-2600 m (Nov. 9, 1963); Iladanda-Helok, 1800-1500 m (Nov. 13, 1963); Yektin-Akasay, 1400-2300 m (Nov. 30, 1963); Birch Hill, Darjeeling, 2100 m (Dec. 28, 1963).

Distr. NE. Himalaya, India, and Indo-China.

Echinacanthus attenuatus Nees in Wall., Pl. Asia. Rar. **3**: 90 (1832)-C. B. Clarke, l.c. 414 (1884).

Phusri-Dhara Pani, 450–900 m (Oct. 16, 1963); Dhara Pani-Dhankuta, 900–1200 m (Oct. 17, 1963); Dhankuta, 1200 m (Oct. 19, 1963); Ranga Pani-Ghorwa, 700–300 m (Dec. 9, 1963); Sibganja-Gauriganja, 200 m (Dec. 12, 1963).

Distr. E. Himalaya (Nepal, Sikkim).

Eranthemum nervosum (Vahl) R. Br., Prodr. Fl. Nov. Holl. **1**: 476 (1810)–R. Benoist in Fl. Gén. Ind.-Chin. **4**: 660 (1935).

Justicia nervosa Vahl, Enum. Pl. **1**: 164 (1804).

Daedalacanthus nervosus (Vahl) T. Anders. in Journ. Linn. Soc. **9**: 487 (1867)–C. B. Clarke, l.c. 418 (1884).

Tista, 350 m (Jun. 20, 1960); above Tista Bazar, 500 m (Mar. 17, 1963).

Distr. Tropical Himalaya (Punjab to Bhutan), Burma, and Indo-China.

Eranthemum strictum Colebr. ex Roxb., Fl. Ind. ed. Carey, **1**: 114 (1820)–Bot. Mag. t. 3068 (1830).

Daedalacanthus strictus (Colebr) T. Anders. in Journ. Linn. Soc. **9**: 484 (1867)–Clarke, l.c. 419 (1884).

Dhara Pani–Dhankuta, 900–1200 m (Oct. 17, 1963); Ghorwa–Sanichare, 300–200 m (Dec. 10, 1963).

Distr. E. Himalaya (Nepal to Bhutan), and Khasia.

Hemigraphis latebrosa Nees in DC., Prodr. **11**: 723 (1847).

var. **rupestris** C. B. Clarke, l.c. 424 (1884)–Haines, Bot. Bihar Orissa **4**: 672 (1922).

Khebang–Bharomdin, 1700–1000 m (Nov. 24, 1963).

Distr. Deccan Penisula, and N. W. Himalaya (Kumaon to Nepal).

Hygrophila polysperma T. Anders. in Journ. Linn. Soc. **9**: 456 (1867)–C. B. Clarke, l.c. 406 (1884).

Illam–Ranga Pani, 1200–700 m (Dec. 8, 1963); Sibganja–Mahara Bahara, 200 m (Dec. 12, 1963).

Distr. Throughout India, and Indo-China.

Hygrophila salicifolia (Vahl) Nees in Wall., Pl. Asia. Rar. **3**: 81 (1832)–Wight, Icon. t. 1490 (1850)–C. B. Clarke, l.c. 407 (1884).

Ruellia salicifolia Vahl, Symb. **3**: 84 (1794).

Sanichare–Sibganja, 200 m (Dec. 11, 1963); Mahara–Kathgara, 200 m (Dec. 13, 1963).

Distr. Himalaya, India, Indo-China, Malaya, Philippines, S. China, Formosa, and Ryukyu.

Hygrophila spinosa T. Anders. in Journ. Linn. Soc. **7**: 22 (1865); **9**: 457 (1867)–C. B. Clarke, l.c. 408 (1884).

Mahara Bahara–Kathgara, 200 m (Dec. 13, 1963).

Distr. India, Burma, Indo-China, and Malaya.

Justicia procumbens L., Sp. Pl. ed. 1, **1**: 15 (1753).

var. **simplex** (D. Don) Yamazaki, comb. nov.

Justicia simplex D. Don, Prodr. Fl. Nepal. 118 (1825)–Clarke, l.c. 539 (1885).

Godavari, Kathmandu 1500 m (Sep. 18, 1963); Chobar Gorge, Kathmandu, 1200 m (Sep. 21, 1963); Kathmandu Airport, 1300 m (Oct. 13, 1963); Dhankuta, 1200 m (Oct. 19, 1963); Taplejung–Garhi Danra, 2000–2200 m (Nov. 3, 1963); Tuwa–Taplethok, 1800–1300 m (Nov. 5, 1963); Helok, 1500 m (Nov. 8, 1963); Iladanda–Helok, 1800-1500 m (Nov. 13, 1963).

Distr. Central and north India.

Justicia quinqueangularis Koen. ex Roxb., Fl. Ind. ed. Carey, **1**: 134 (1820)-C. B. Clarke, l.c. 536 (1885).

Ruellia quinqueangularis Nees in Wall., Pl. Asia. Rar. **3**: 101 (1832).

Justicia peploides T. Anders. var. *angustifolia* T. Anders. in Journ. Linn. Soc. **9**: 511 (1867).

Sibganja-Gauriganja, 200 m (Dec. 12, 1963); Mahara Bahara-Kathgara, 200 m (Dec. 13, 1963).

Distr. Himalaya, C. & N. India, Indo-China, and Formosa.

Lepidagathis incurva D. Don, Prodr. Fl. Nepal. 119 (1825).

Lepidagathis hyalina Nees in Wall., Pl. Asia. Rar. **3**: 95 (1832)-C. B. Clarke, l.c. 521 (1885).

Saramsa, 1100 m (Mar. 21, 1963); Rayang, 250 m (Apr. 21, 1960); Dhankuta, 1200 m (Oct. 19, 1963); Bharomdin-Tharpu, 1000-1200 m (Nov. 25, 1963); Dhara Pani-Illam, 1500-1200 m (Dec. 5, 1963); Illam-Ranga Pani, 1200-700 m (Dec. 8, 1963); Ranga Pani-Ghorwa, 700-300 m (Dec. 9, 1963).

Distr. N. India, Burma, Indo-China, S. China, Malaya, and Philippines.

Peristrophe bicalyculata Nees in Wall., Pl. Asia. Rar. **3**: 113 (1832)-C. B. Clarke, l.c. 554 (1885).

Ranga Pani-Ghorwa, 700-300 m (Dec. 9, 1963).

Distr. Himalaya, India, Indo-China, and Malaya.

Peristrophe speciosa Nees in Wall., Pl. Asia. Rar. **3**: 113 (1832)-C. B. Clarke, l.c. 556 (1885).

Tuwa-Taplethok, 1800-1300 m (Nov. 5, 1963); Bharmodin-Tharpu, 1000-1200 m (Nov. 25, 1963); Yektin-Akasay, 1400-2300 m (Nov. 30, 1963).

Distr. Subtropical Himalaya (Kumaon to Bhutan).

Phaylopsis parviflora Willd., Sp. Pl. **3**: 342 (1800)-Clarke, l.c. 417 (1884).

Aetheilema reniforme Nees in Wall., Pl. Asia. Rar. **3**: 94 (1832)-Wight, Icon. t. 1533 (1850).

Phusri-Dhara Pani, 450-900 m (Oct. 16, 1963).

Distr. Africa, Madagascar, Himalaya, India, and Indo-China.

Phlogacanthus thyrsiflorus (Roxb.) Nees in Wall., Pl. Asia. Rar. **3**: 99 (1832)-C. B. Clarke, l.c. **4**: 512 (1884).

Justicia thyrsiflora Roxb., Fl. Ind. ed. Carey, **1**: 114 (1820).

Khebang-Bharomdin, 1700-1000 m (Nov. 24, 1963); Illam-Ranga Pani, 1200-700 m (Dec. 8, 1963); Ranga Pani-Ghorwa, 700-300 m (Dec. 9, 1963); Ghorwa-Sanichare, 300-200 m (Dec. 10, 1963).

Distr. Himalaya, and N. India.

Ruellia tuberosa L., Sp. Pl. ed. 1, **2**: 635 (1753)-Haines, Bot. Bihar Orissa **4**: 675 (1922).

Biratnagar, 200 m (Oct. 14, 1963).

Distr. A native of tropical America; naturalized in E. India.

Rungia himalayensis C. B. Clarke in Hooker f., Fl. Brit. Ind. **4**:5 48 (1885).

Yektin, 1100 m (Nov. 29, 1963); Yektin-Akasay, 1400-2300 m (Nov. 30, 1963).

Distr. E. Himalaya (Nepal, Sikkim).

Rungia parviflora Nees in Wall., Pl. Asia. Rar. **3**: 110 (1832)–C. B. Clarke, l.c. 550 (1885).

Takdah–Rayang, 1600–250 m (Apr. 20, 1960); Phusri–Dhara Pani, 450–900 m (Oct. 16, 1963); Dhara Pani–Dhankuta, 900–1200 m (Oct. 17, 1963); Dhankuta, 1200 m (Oct. 20, 1963); Dumhan–Taplejung, 700–2000 m (Oct. 30, 31, 1963, fl. violet); Taplejung, 2000 m (Nov. 1, 1963); Bharomdin–Tharpu, 1000–1200 m (Nov. 25, 1963); Khunga–Yektin, 2000–1700 m (Nov. 28, 1963); Dhara Pani–Illam, 1500–1200 m (Dec. 5, 1963); Ranga Pani–Ghorwa, 700–200 m (Dec. 9, 1963); Ghorwa–Sanichare, 300–200 m (Dec. 10, 1963).

Distr. Himalaya, India, Malaya, Indo-China, and S. China.

Strobilanthes agrestis C. B. Clarke in Hooker f., Fl. Brit. Ind. **4**: 466 (1884).

Mul Pokhari–Dumhan (Oct. 30, 1963); Helok–Iladanda (Nov. 8, 1963).

Distr. E. Himalaya (Nepal to NEFA).

Strobilanthes atropurpureus Nees in Wall., Pl. Asia. Rar. **3**: 86 (1832); in DC., Prodr. **11**: 195 (1847)–C. B. Clarke, l.c. 472 (1884).

Iladanda–Helok, 1800–1500 m (Nov. 13, 1963); Ghatte, 1300 m (Nov. 17, 1963, fl. dark violet).

Distr. Himalaya (Jamu to Nepal).

Strobilanthes auriculatus Nees in Wall., Pl. Asia. Rar. **3**: 86 (1832).

var. **Edgeworthianus** (Nees) C. B. Clarke in Fl. Brit. Ind. **4**: 453 (1884).

Strobilanthes Edgeworthiana Nees in DC., Prodr. **11**: 190 (1847).

Dhankuta, 1200 m (Oct. 21, 1963); Tharpu–Chyangthaphu, 1200–1100 m (Nov. 26, 1963).

Distr. Himalaya (Siwalik to Sikkim), Burma, and Indo-China.

Strobilanthes capitatus (Nees) T. Anders. in Journ. Linn. Soc. **9**: 475 (1867)–C. B. Clarke, l.c. 459 (1884).

Goldfussia capitata Nees in Wall., Pl. Asia. Rar. **3**: 88 (1832).

Dhankuta, 1200 m (Oct. 19 & 21, 1963); Dumhan–Tamur River, 700 m (Oct. 31, 1963); Dumhan–Taplejung, 700–2000 m (Nov. 1, 1963); Taplejung–Garhi Danra, 2000–2200 m (Nov. 3, 1963); Khebang–Bharomdin, 1700–1000 m (Nov. 24, 1963, fl. violet); Bharomdin–Tharpu, 1000–1200 m (Nov. 25, 1963); Tharpu–Chyangthaphu, 1200–1100 m (Nov. 26, 1963); Dhara Pani–Illam, 1500–1200 m (Dec. 5, 1963); Illam, 1200 m (Dec. 6, 1963); Illam–Ranga Pani, 1200–700 m (Dec. 8, 1963); Ranga Pani–Ghorwa, 700–300 m (Dec. 9, 1963); Ghorwa–Sanichare, 300–200 m (Dec. 10, 1963).

Distr. E. Himalaya (Nepal to Bhutan).

Strobilanthes coloratus (Nees) T. Anders. in Journ. Linn. Soc. **9**: 481 (1867)–C. B. Clarke, l.c. 473 (1884)–Hooker f. in Bot. Mag. t. 6922 (1887).

Goldfussia colorata Nees in Wall., Pl. Asia. Rar. **3**: 89 (1832).

Phusri–Dhara Pani, 450–900 m (Oct. 16, 1963).

Distr. E. Himalaya (Nepal to Bhutan).

Strobilanthes divaricatus (Nees) T. Anders. in Journ. Linn. Soc. **9**: 478 (1867)–C. B. Clarke, l.c. 468 (1884).

Goldfussia divaricata Nees in Wall., Pl. Asia. Rar. **3**: 89 (1832).

Lagyap, Gangtok, 2200 m (Sep. 13, 1964, fl. deep violet); Birch Hill, Darjeeling, 2100 m (Sep. 21, 1964).

Distr. E. Himalaya (Nepal to Bhutan), and Khasia.

Strobilanthes glutinosus Nees in Wall., Pl. Asia. Rar. **3**: 86 (1832)-C. B. Clarke, l.c. 458 (1884).

Bilbatay Bhanjang-Hati Sar, 2200-2700 m (Oct. 27, 1963, fl. pale violet); Hati Sar-Minchin Dhap, 2700-2800 m (Oct. 28, 1963).

Distr. Himalaya (Kashmir to Nepal).

Strobilanthes lamiifolius (Nees) T. Anders. in Journ. Linn. Soc. **9**: 476 (1867)-C. B. Clarke, l.c. 463 (1884).

Goldfussia lamiifolia Nees in Wall., Pl. Asia. Rar. **3**: 88 (1832).

Sunderijal Waterfall, Kathmandu, 1500 m (Sep. 20, 1963).

Distr. E. Himalaya (Nepal).

Strobilanthes pentstemonoides (Nees) T. Anders. in Journ. Linn. Soc. **9**: 477 (1867)-C. B. Clarke, l.c. 460 (1884).

Goldfussia pentstemonoides Nees in Wall., Pl. Asia. Rar. **3**: 88 (1832)-Wight, Icon. t. 1510 (1850).

Godavari, Kathmandu, 1500 m (Sep. 18, 1963); Kathmandu Airport, 1300 m (Oct. 13, 1963).

Distr. E. Himalaya (Nepal to Bhutan), and Indo-China.

Strobilanthes urophyllus (Walt.) Nees in DC., Prodr. **11**: 192 (1847).

var. **sikkimensis** C· B. Clarke in Hooker f., Fl. Brit. Ind. **4**: 472 (1884).

Batasi, 2000 m (May 2, 1960).

Distr. E. Himalaya (Sikkim).

Strobilanthes Wallichii Nees in Wall., Pl. Asia. Rar. **3**: 87 (1832)-Clarke, l.c. 471 (1884).

Ruellia alata Wall., Pl. Asia. Rar. **1**: 26, t. 31 (1830).

Goldfussia Thomsoni Hooker in Bot. Mag. t. 5119 (1859).

Senchal-Tiger Hill, 2400-2500 m (Jun. 23, 1960); Lagyap, Gangtok, 2200 m (Sep. 13, 1964, fl. pale violet).

Distr. E. Himalaya (Nepal to Bhutan), and W. China (Yunnan).

Thunbergia coccinea Wall., Tent. Fl. Napal. 48, t. 37 (1826)-T. Anders. in Journ. Linn. Soc. **9**: 448 (1867)-C. B. Clarke, l.c. 393 (1884).

Murhay, 2000 m (Oct. 23, 1963, fl. orange red); Hilay-Murhay, 1800-2000 m (Oct. 23, 1963); Mul Pokhari-Dumhan, 2400-700 m (Oct. 30, 1963); Garhi Danra-Tuwa, 2200-1800 m (Nov. 4, 1963); Bharomdin-Tharpu, 1000-1200 m (Nov. 25, 1963); Khunga Chuli-Yektin, 2000-1700 m (Nov. 28, 1963); Illam-Ranga Pani, 1200-800 m (Dec. 8, 1963).

Distr. Himalaya, E. India, and Indo-China.

Thunbergia fragrans Roxb., Pl. Corom. **1**: 47, t. 67 (1795)-C. B. Clarke, l.c. 390 (1884).

Below Chumbhati, 500 m (Sep. 10, 1964, fl. white); Pouwa, Kathmandu, 1600 m (Oct. 9, 1962); Ranga Pani-Ghorwa, 700-300 m (Dec. 9, 1963).

Distr. Throughout tropical Asia and Australia.

Thunbergia grandiflora Roxb. [Hort. Beng. 45 (1814), nom. nud.] Fl. Ind. ed. 2, **3**: 34 (1832)-C. B. Clarke, l.c. 392 (1884).

Ranga Pani-Ghorwa, 700-300 m (Dec. 9, 1963).

Distr. E. India, Malaya, Indo-China, and S. China.

Thunbergia lutea T. Anders. in Journ. Linn. Soc. **9**: 448 (1867)-C. B. Clarke, l.c. 392 (1884).

Sinduwa, Dhankuta, 2100 m (Oct. 24, 1963); Hilay-Murhay, 1800–2000 m (Oct. 27, 1963).

Distr. E. Himalaya (Nepal, Sikkim).

PHRYMACEAE (by Hiroshi Hara)

Phryma Leptostachya L., Sp. Pl. ed. 1, **2**: 601 (1753).

var. **oblongifolia** (Koidzumi) Honda in Bot. Mag. Tokyo **50**: 608 (1936)-Hara in Journ. Fac. Sci. Univ. Tokyo Bot. **6**: 377 (1956).

P. Leptostachya L. sensu C. B. Clarke in Fl. Brit. Ind. **4**: 562 (1885).

P. oblongifolia Koidzumi in Bot. Mag. Tokyo **43**: 400 (1929).

P. Leptostachya var. *asiatica* Hara, Enum. Sperm. Jap. **1**: 297 (1949).

P. Leptostachya L. subsp. *asiatica* (Hara) Kitamura in Act. Phytotax. Geobot. **17**: 7 (1957).

Godavari, Kathmandu, 1500 m (Sep. 18, 1963; cult. in Karuizawa, Sep. 1965, fl. & fr.); Kakani, 2100–2200 m (Sep. 24, 1963).

Distr. Himalaya (Kashmir to Nepal), Khasia, Indo-China, China, Korea, Japan, and E. Siberia.

See a note on page 651.

PLANTAGINACEAE (by Takasi Yamazaki)

Plantago erosa Wallich in Roxb., Fl. Ind. ed. Carey, **1**: 423 (1820)-Pilger in Pfl.-reich IV–269, Ht. **102**: 60 (1937).

Plantago major L. sensu Hooker f., Fl. Brit. Ind. **4**: 705 (1885), p. p.

Gangtok, 1650 m (Mar. 23, 1963); Birch Hill, 2000 m (Apr. 5, 1960); Kurseong, 1550 m (Apr. 12 1960); Batasi–Palmajua, 2300–2600 m (May 3, 1960); Chia Bhanjang-Dentam, 1400–3100 m (May 11, 1960); Nayathang–Phalut, 3300–3500 m (Jun. 2, 1960); Chia Bhanjang-Phalut, 3100–3500 m (Jun. 2, 1960) ; Sinduwa, 2100 m (Oct. 23, 1963); Murhay–Bilbatay Bhanjang, 2000–2200 m (Oct. 24, 1963) Hati Sar-Minchin Dhap (Oct. 28, 1963).

Distr. Himalaya, India, Ceylon, Indo-China, S. China, and Formosa.

Plantago major L., Sp. Pl. ed. 1, **1**: 112 (1753).

var. **angusta** (Pilger) Yamazaki, comb. nov.

P. asiatica L. var. *angusta* Pilger in Not. Bot. Gard. Berlin-Dahlem **9**: 90 (1927); in Pfl.-reich IV–269, Ht. **102**: 59 (1937).

Dhankuta, 1200 m (Oct. 21, 1963); Iladanda-Selap, 1800–2600 m (Nov. 9, 1963); Ghatte, 1600 m (Nov. 16, 1963); below Siling Tzokupa, 2100 m (Nov. 21, 1963).

Distr. Himalaya.

RUBIACEAE (by Takasi Yamazaki, *Galium* and *Rubia* by Hiroshi Hara)

Adina cordifolia (Willd. ex Roxburgh) Hooker f. in Bentham et Hooker f., Gen. Pl. **2**: 30 (1873)-Fl. Brit. Ind. **3**: 24 (1880).

Nauclea cordifolia Willd. ex Roxb., Pl. Corom. **1**: 40, t. 53 (1795).

Illam–Ranga Pani, 200 m (Dec. 8, 1963, fr); Ranga Pani–Ghorwa, 700–300 m (Dec. 9, 1963, fr.); Kathgara–Rangali, 200 m (Dec. 14, 1963, fr.); Rangali-Biratnagar, 200 m (Dec. 15, 1963, fr).

Distr. Himalaya, India, and Ceylon.

Aidia tetrasperma (Roxb.) Yamazaki, comb. nov.

Gardenia tetrasperma Roxburgh, Fl. Ind. ed. 2, **1**: 709 (1832).

Randia tetrasperma Roxb. ex Hooker f., Fl. Brit. Ind. **3**: 109 (1880)-Kar & Panigrahi, l.c. 235 (1963).

Kakani Hill, northwest of Kathmandu, 2100–2200 m (Sep. 24, 1963); Taplejung 2000 m (Nov. 2, 1963); Helok-Iladanda, 1500–1800 m (Nov. 8, 1963); Thakma Khola–Bhandukay, 3200–2400 m (Nov. 14, 1963); Bhandukay-Ghatte, 2400–1600 m (Nov. 16, 1963).

Distr. Himalaya (Kashmir to NEFA), and Assam.

Anthocephalus Cadamba Miquel, Fl. Ind. Bat. **2**: 135 (1856)–Fl. Brit. Ind. **3**: 23 (1880)-Kar & Panigrahi, l.c. 228 (1963).

Sibganja-Mahara Dahara, 200 m (Dec. 12, 1963).

Distr. India, Ceylon, Malaya, and Sumatra.

Argostemma sarmentosum Wallich in Roxb., Fl. Ind. ed. Carey, **2**: 324 (1824)-Fl. Brit. Ind. **3**: 42 (1880).

Tista, Darjeeling, 300 m (Jun, 20, 1960).

Distr. Himalaya (Mussoorie to Bhutan), and Assam.

Argostemma verticillatum Wallich in Roxb, Fl. Ind. ed. Carey, **2**: 325 (1824)-Fl. Brit. Ind. **3**: 43 (1880)-Kar & Panigrahi, l.c. 228 (1963).

Gangtok, 1700 m (Jun. 13, 1960.); Zalipur, 1000 m, growing on wet rock (Sep. 12, 1964).

Distr. E. Himalaya (Nepal, Sikkim), Assam, Indo-China, and W. China (Yunnan).

Borreria laevicaulis (Miq.) Ridley, Fl. Malay Pen. **2**: 176 (1923)-Craib, Fl. Siam. Enum. **2** (2): 231 (1934).

Bigelovia laevicaulis Miquel, Fl. Ind. Bat. **2**: 335 (1856).

Taplethok–Helok, 1300–1500 m (Nov. 6, 1963); Helok, 1500 m (Nov. 7, 1963).

Distr. Himalaya, India, Malaya, and Java.

Borreria latifolia Schumann in Mart., Fl. Braz. VI–**6**: 61 (1888)-Ridley, Fl. Malay Pen. **2**: 175 (1923).

Phusri–Dhara Pani, 450–900 m (Oct. 16, 1963); Khebang–Bharomdin, 1700–1000 m (Nov. 24, 1963); Tharpu–near Chyangthaphu, 1200–1100 m (Nov. 26, 1963); Chyangthaphu–Birwa, 1100–2400 m (Nov. 27, 1963); Dhara Pani–Illam, 1500–1200 m (Dec. 5, 1963); Illam–Ranga Pani, 1200–700 m (Dec. 8, 1963); Ghorwa–Sanichare, 200 m (Dec. 10, 1963); Namli, Gangtok, 900 m (Sep. 12, 1964, fl. purplish white).

Distr. A native of tropical America; naturalized in tropical Asia.

Borreria setidens (Miquel) Ridley, Fl. Malay Penins. **2**: 177 (1923).

Bigelovia setidens Miquel, Fl. Ind. Bat. **2**: 336 (1856).

Rayang, Darjeeling; 250 m (Apr. 20, 1960); Bharomdin–Tharpu, 1000–1200 m (Nov. 25, 1963); Ghorwa–Sanichare, 200 m (Dec. 10, 1963).

Distr. India, Java, Malaya, Indo-China, and Micronesia.

Canthium parvifolium Roxburgh [Hort. Beng. 15 (1814), nom. nud.] Fl. Ind. ed. 2, **1**: 534 (1832)-Fl. Brit. Ind. **3**: 135 (1880).

Ranga Pani–Ghorwa, 700–300 m (Dec. 9, 1963).

Distr. Himalaya, India, Malaya, Indo-China, and S. China.

Coffea bengalensis Roxburgh [Hort. Beng. 15 (1814), nom. nud.] Fl. Ind. ed. 2, **1**: 540 (1832)–Fl. Brit. Ind. **3**: 153 (1880)–Kar & Panigrahi, l.c. 229 (1963).

Tista Bazar, Darjeeling, 300 m (Jun. 20, 1960); Rangpo–Tista Bazar, 350 m (Mar. 17, 1963, fl. pure white); Naya Bazar–Namchi, 700 m (Mar. 27, 1963); Phusri–Dhara Pani, 450–900 m (Oct. 16, 1963, fl.); Dhara Pani–Dhankuta, 900–1200 m (Oct. 17, 1963, fr.); Ranga Pani–Ghorwa, 700–300 m (Dec. 9, 1963, fr.).

Distr. Tropical Himalaya (Kumaon to Bhutan), Bengal, Assam, and Burma.

Galium acutum Edgeworth in Trans. Linn. Soc. **20**: 61 (1846)–Fl. Brit. Ind. **3**: 208 (1881)–Cufodontis in Oester. Bot. Zeits. **89**: 239 (1940).

G. himalayense Klotzsch in Bot. Erg. Reis. Pr. Waldem. 88, t. 73 (1862).

Gangtok, 1600 m (Jun. 13, 1960, fl.); Bilbatay Bhanjang, 2200 m (Oct. 26, 1963, fl.); Lam Pokhari, 2900 m (Oct. 28, 1963, fl. & fr.).

Distr. Himalaya (Kunawur to Sikkim).

Galium asperifolium Wallich ex Roxburgh, Fl. Ind. ed. Carey, **1**: 381 (1820)–Cufodontis, l.c. 239 (1940).

G. Mollugo L. sensu Fl. Brit. Ind. **3**: 207 (1881).

G. Mollugo L. subsp. *asperifolium* (Wall.) Kitamura in Faun. & Fl. Nepal Himal. 230 (1955).

Godavari, 1500 m (Sep. 18, 1953, fl.); Sinduwa, 2100 m (Oct. 24, 1963, fl.); Taplejung, 1900 m (Nov. 2, 1963, fl.); Zongi–Iladanda, 2600–1800 m (Nov. 12, 1963, fl.); Yamphodin, 2100 m (Nov. 16, 1963, fl.).

The hairiness of this plant varies very much by stage. The specimen from Zongi has pilose flowering stems with minute recurved hairs, but in its young shoots, stems and leaves are densely pilose with spreading soft longer hairs.

var. **sikkimense** (Gandoger) Cufodontis, l. c. 241 (1940).

G. sikkimense Gandoger in Bull. Soc. Bot. France **66**: 307 (1920).

Darjeeling, 2150 m (Jun. 26, 1960 & Sep. 15, 1964, fl.); Ghum, 2300 m (Jun. 22, 1960, fl.); Damthang–Rabong La, 2300 m (Mar. 28, 1963, fl. & fr.); Sinduwa, 2100 m (Oct. 23 & 24, 1963, fr.); Lelep, 2600 m (Nov. 9, 1963, fl.); Yamphodin, 1700 m (Nov. 16, 1963, fl.); Lagyap, 2200 m (Sep. 13, 1964, fl.).

Distr. sp. NE. Afghanistan, Himalaya (east to Bhutan), Khasia, India, Ceylon, N. Burma, Thai, and W. China (east to Hupeh).

Galium asperuloides Edgeworth in Trans. Linn. Soc. **20**: 61 (1846).

Asperula consanguinea Klotzsch in Bot. Erg. Reis. Pr. Waldem. 87, t. 74 (1862).

var. **Hoffmeisteri** (Klotzsch) Handel-Mazzetti, Symb. Sin. **7**: 1027 (1936)–Cufodontis in Oester. Bot. Zeits. **89**: 235 (1940).

Asperula Hoffmeisteri Klotzsch, l.c. 87, t. 75 (1862).

Galium triflorum var. *Hoffmeisteri* (Klotz.) Hook. f., Fl. Brit. Ind. **3**: 205 (1881).

Palmajua–Rimbick, 2300–2200 m (May 5, 1960, fl.); Chia Bhanjang–Phalut, 3100–3500 m (Jun. 2, 1960, fl.); Garibans–Tonglu, 2800–3000 m (Jun. 7, 1960, fl. & fr.); Minchin Dhap–Mul Pokhari, 2900–2500 m (Oct. 29, 1963, fr.).

Distr. Himalaya (Simla to Bhutan), and W. China (east to W. Hupeh).

Galium elegans Wallich ex Roxburgh, Fl. Ind. ed. Carey, **1**: 382 (1820)–Cufodontis, l.c. 228 (1940)–Kitamura in Act. Phytotax. Geobot. **16**: 195 (1956).

G. rotundifolium L. sensu Fl. Brit. Ind. **3**: 204 (1881).

Darjeeling, 2100 m (Apr. 2, 7, & Jun. 18, 1960; Dec. 26, 1963, fr.); Senchal, 2400 m (Jun. 23, 1963, fl.); Garibans–Tonglu, 2800–3000 m (Jun. 7, 1960); Rabong La–Temi, 1200 m (Mar. 28, 1963, fr.); Pouwa, Kathmandu, 1600 m (Oct. 9, 1963); Ghatte–Khebang, 1600–2400 m (Nov. 19, 1963, fr.); Muhray, 2100 m (Oct. 23, 1963, fr.); Sinduwa, 2100 m (Oct. 24, 1963, fr.); Taplethok–Helok, 1400–1500 m (Nov. 6, 1963, fr.); Iladanda–Selap, 1800–2600 m (Nov. 9, 1963); Diorali Bhanjang 3500 m (Nov. 17, 1963, fr.).

var. **glabriusculum** Requien ex DC., Prodr. **4**: 600 (1830)–Cufodontis, l.c. 229 (1946).

Mul Pokhari–Gorzu Kosir, 2100 m (Oct. 30, 1963, fr.); Lagyap, Gangtok, 2200 m (Sep. 13, 1964, fr.).

Distr. sp. Himalaya (Kashmir to Sikkim), Khasia, Manipur, Thai, N. Burma, W. China, and Formosa.

In our specimens, the leaves are oval to elliptic, and roundish and mucronulate at the top, or sometimes shortly acutish. In most of them, the flowering stems excepting the lower part are sparsely pilose with recurved hairs, but the leaves and stems of young shoots are densely pubescent with spreading soft hairs, as observed also in *G. asperifolium* and *G. hirtiflorum*. The two specimens referred to var. *glabriusculum* have glabrescent stems even in young shoots.

Galium hirtiflorum Requien ex DC., Prodr. **4**: 600 (1830)–Fl. Brit. Ind. **3**: 206 (1881).

Sunderijal, 1600 m (Sep. 20, 1963, fl.); Kathmandu, 1500 m (Oct. 13, 1963, fr.); Dhankuta, 1200 m (Oct. 19, 1963, fr.); Dhankuta–Hilay (Oct. 23, 1963, fl. & fr.); Sinduwa, 2100 m (Oct. 23, 1963, fr.); Dumhan–Taplejung, 1500 m (Nov. 1, 1963, fr.); Taplejung–Garhi Danra, 1900–2200 m (Nov. 3, 1963, fr.); Iladanda–Helok, 1800–1500 m (Nov. 13, 1963, fr.).

Distr. Himalaya (Garhwal to Sikkim).

Hedyotis corymbosa (L.) Lamark, Encycl. Méth. **1**: 272 (1791)–Hara, Enum. Sperm. Jap. **2**: 18 (1952).

Oldenlandia corymbosa L., Sp. Pl. ed. 1, **1**: 119 (1753)–Fl. Brit. Ind. **3**: 64 (1880).

Bagdogra, 200 m (Jun. 27, 1960); Biratnagar, 200 m (Oct. 14, 1963); Dhankuta, 1200 m (Oct. 18, 1963); Mul Pokhari–Dumhan, 2400–700 m (Oct. 30, 1963); Dumhan, by the Tamur river, 700 m (Oct. 31, 1963); Helok, 1500 m (Nov. 7, 1963); Iladanda–Selap, 1800–2600 m (Nov. 9, 1963); Bharomdin–Tharpu, 1000–1200 m (Nov. 25, 1963); Sibganja-Gauriganja, 200 m (Dec. 12, 1963).

Distr. Widespread over the tropical regions of the World.

Hedyotis diffusa Willdenow, Sp. Pl. **1**: 566 (1797)–Hara, l.c. **2**: 18 (1952).

Oldenlandia diffusa (Willd.) Roxb., Hort. Beng. 11 (1814), nom. nud.–Fl. Brit. Ind. **3**: 65 (1880).

Rayang, Darjeeling, 250 m (Apr. 21, 1960); Rangpo–Tista, 350–300 m (Jun. 18, 1960).

Distr. Tropical and subtropical eastern Asia, India to S. China and Japan, Borneo, and Philippines.

Hedyotis lineata Roxb. [Hort. Beng. 10 (1814), nom. nud.] Fl. Ind. ed. 2, **1**: 365 (1832)–Fl. Brit. Ind. **3**: 59 (1880)–Kar & Panigrahi, l.c. 231 (1963).

Kathmandu, 1300 m (Sep. 23, 1963).

Distr. E. Himalaya (Nepal, Sikkim), Bengal, and Burma.

Hedyotis ovatifolia Cavanilles, Icon. Pl. Hisp. **6**: 52, t. 373 (1801).

Oldenlandia nudicaulis Roth, Nov. Pl. Sp. 96 (1821)–Fl. Brit. Ind. **3**: 70 (1880).

O. ovatifolia (Cav.) DC., Prodr. **4**: 427 (1830)–Merrill, Enum. Philip. Pl. **3**: 494 (1923).

Dhara Pani–Dhankuta, 900–1200 m (Oct. 17, 1963).

Distr. Himalaya, India, Indo-China, Formosa, Malaya, and Philippines.

Hedyotis paniculata (L.) Decne. ex Kurz in Journ. Asia. Soc. Beng. **2**: 134 (1877).

Oldenlandia paniculata L., Sp. Pl. ed. 2, 1667 (1763)–Burman, Fl. Ind. 38, t. 15, f. 1 (1768)–Fl. Brit. Ind. **3**: 69 (1880), p. p.–Haines, Bot. Bihar Orissa **4**: 449 (1922).

Sunderijal Waterfall near Kathmandu, 1600 m (Sep. 20, 1963. fr.).

Distr. Himalaya, and India.

Hedyotis scandens Roxburgh [Hort. Beng. 10 (1814), nom. nud.] ex D. Don, Prodr. Fl. Nepal 134 (1825)–Fl. Brit. Ind. **3**: 57 (1880).

Oldenlandia scandens (Roxb.) O. Kuntze, Rev. Gen. P. 293 (1891).

Takdah, Darjeeling, 600 m (Apr. 20, 1960); Tingling Bridge–Yoksam, 1000–1700 m (May 16, 1960); Orchid Sanctuary, 1500 m (Mar. 18, 1963); Namli, Gangtok, 900 m (Sep. 12, 1964) ; Phusri–Dhara Pani, 450–900 m (Oct. 16, 1963); Mul Pokhari–Dumhan, 1500–700 m (Oct. 30, 1963); Dumhan–Taplejung, 700 m–2000 m (Nov. 1, 1963); Garhi Danra–Tuwa, 2200–1800 m (Nov. 4, 1963); Bhandukay–Ghatte, 2400–1600 m (Nov. 16, 1963); Illam, 1200 m (Dec. 6, 1963); Illam–Ranga Pani, 1200–700 m (Dec. 8, 1963).

Distr. E. Himalaya (Nepal, Sikkim), Khasia, Burma, and Indo-China.

Hedyotis verticillata (L.) Lamark, Encycl. Méth. **1**: 271 (1791).

Oldenlandia verticillata L., Mant. Pl. **1**: 40 (1767).

H. hispida Retz., Obs. Bot **4**: 23 (1786)–Fl. Brit. Ind. **3**: 60 (1880).

Rangpo–Tista, Darjeeling, 350 m (Jun. 18, 1960); Ghorwa–Sanichare, 300–200 m (Dec. 10, 1963).

Distr. Himalaya, India, Malaya, Indo-China, China, Ryukyu, Philippines, and Micronesia.

Hymenodictyon excelsum (Roxb.) Wallich in Roxburgh, Fl. Ind. ed. Carey, **2**: 149 (1824)–Fl. Brit. Ind. **3**: 35 (1880).

Cinchona excelsa Roxb., Pl. Corom. **2**: 3, t. 106 (1798).

Gangtok, 1650 m (Jun. 13, 1960, fl.); Ghorwa–Sanichare, 300–200 m (Dec. 10, 1963); Sibganja–Mahara Bahara, 200 m (Dec. 12, 1963); Kathgara–Rangali, 200 m (Dec. 14, 1963).

Distr. Himalaya, India, Burma, Indo-China, Malaya, Philippines, and Java.

Hymenodictyon flaccidum Wall. in Roxb., Fl. Ind. ed. Carey, **2**: 152 (1824)–Fl. Brit. Ind. **3**: 36 (1880).

Below Siling Tzokupa–Khebang, 2100–1700 m (Nov. 22, 1963).

Distr. Himalaya (Garhwal to Bhutan), and Khasia.

Hymenopogon parasiticus Wall. in Roxb., Fl. Ind. ed. Carey, **2**: 157 (1824); Pl. Asia. Rar. **3**: 15, t. 227 (1831)–Fl. Brit. Ind. **3**: 34 (1880)–Kar & Panigrahi, l.c. 230 (1963).

Birch Hill, 2180 m (Apr. 2, 1960); Palmajua, 2200 m (May 4, 1960); Gangtok, 1650 m (Jun. 15, 1960); Dhankuta–Murhay, 1200–2000 m (Oct. 23, 1963); Murhay–Bilbatay

Bhanjang, 2100–2200 m (Oct. 24, 1963); Sinduwa 2100 m (Oct. 24, 1963); below Siling Tzokupa–Khebang, 2100–1700m (Nov. 22, 1963); Tharpu–near Chyangthaphu, 1200–1100 m (Nov. 26, 1963); near Chyangthaphu–Birwa, 1100–2400 m (Nov. 27, 1963); Yektin–Batasay, 1400–2400m (Nov. 30, 1963); Batasay–Bhuspate Danra, 2400–2900 m (Dec. 1, 1963); Bhuspate Danra–Mai Majuwa, 3100–1600 m (Dec. 3, 1963).

Distr. Temperate Himalaya (Kumaon to Bhutan), Burma, and Indo-China.

Hyptianthera stricta Wight et Arnott, Prodr. Fl. Ind. Orient. 399 (1834)–Fl. Brit. Ind. **3**: 121 (1880)–Hooker, Icon. Pl. t. 3005 (1915).

Randia stricta Roxb., Hort. Beng. 15 (1814), nom. nud.

Illam–Ranga Pani, 1200–700 m (Dec. 8, 1963); Ghorwa-Sanchare, 200 m (Dec. 10, 1963).

Distr. Himalaya, N. India, Khasia, Burma, and Indo-China.

Ixora undulata Roxburgh [Hort. Beng. 10 (1814), nom. nud.] Fl. Ind. ed. 2, **1**: 385 (1832)–Fl. Brit. Ind. **3**: 147 (1880)–Kar & Panigrahi, l.c. 231 (1963).

Siliguri-Kurseong (Apr. 29, 1960).

Distr. E. Himalaya (Nepal to NEFA), and Assam.

Knoxia corymbosa Willd., Sp. Pl. **1**: 582 (1797)–Fl. Brit. Ind. **3**: 128 (1880)–Kar & Panigrahi, l.c. 231 (1963).

Ghorwa-Sanichare, 200 m (Dec. 10, 1963, fr.).

Distr. Tropical India to China, Malaya, Philippines, and tropical Australia.

Lasianthus Biermanni King ex Hooker f., Fl. Brit. Ind. **3**: 190 (1880)–Kar & Panigrahi, l.c. p. 231 (1963).

Palmajua-Rimbick, 2200–2300 m (May 5, 1960); Yoksam-Bakkim, 1600–2200 m (May 18, 1960).

Distr. E. Himalaya (Sikkim, NEFA), and Assam.

Leptodermis lanceolata Wall. in Roxb., Fl. Ind. ed. Carey, **2**: 191 (1824)–Fl. Brit. Ind. **3**: 198 (1880)–Kar & Panigrahi, l.c. 232 (1963).

Kakani Hill, northwest of Kathmandu, 2200 m (Sep. 24, 1963, fl. white-pale blue); Garhi Danra–Tuwa, 2200–1800 m (Nov. 4, 1963); Tuwa–Taplethok, 1800–1300 m (Nov. 5, 1963); Taplethok-Helok, 1400–1500 m (Nov. 6 1963); Helok-Iladanda, 1500–1800 m (Nov. 8, 1963).

Distr. Himalaya (Kashmir to NEFA).

Luculia gratissima (Wall.) Sweet, Brit. Fl. Gard. **2**, t. 145 (1826)–Hooker in Bot. Mag. t. 3946 (1842)–Fl. Brit. Ind. **3**: 36 (1880).

Cinchona gratissima Wall. in Roxb. Fl, Ind. ed. Carey, **2**: 154 (1824).

Palmajua–Rimbick, 2200-2300 m (May 5, 1960, fr.); Kakani, northwest of Kathmandu, 2100–2200 m (Sep. 24, 1963); Murhay, 2000 m (Oct. 23, 1963, fl. pink); Dhankuta-Hilay, 1200–1800 m (Oct. 23, 1963, fl. rose); Taplejung–Garhi Danra, 2000–2200 m (Nov. 3, 1963); Helok, 1500 m (Nov. 9, 1963); Ghatte–Khebang, 1600–1700 m (Nov. 19, 1963); Khebang–below Siling Tzokupa, 2100–1700m (Nov. 20 & 22, 1963, fl. deep rose); Khebang, 1700 m (Nov. 23, 1963, fl.); Birwa–Yektin, 2400–1700 m (Nov. 28, 1963); Mai Majuwa–Dhara Pani, 1600–1500 m (Dec. 4, 1963).

Distr. E. Himalaya (Nepal to Bhutan).

Meyna pubescens (Kurz) Robyns in Bull. Jard. Bot. Bruxelles **11**: 235 (1928).

Vangueria spinosa Roxb. var. *mollis* Wall. ex Hooker f., Fl. Brit. Ind. **3**: 136 (1880)–Pitard in Fl. Gén. Indo-Chin. **3**: 302 (1924).

V. pubescens Kurz, For. Fl. Burma **2**: 34 (1887)–Haines, Bot. Bihar Orissa **4**: 439 (1922).

Kathgara–Rangali, 200 m (Dec. 14, 1963, fr.).

Distr. Himalaya, India, Burma, and Indo-China.

Meyna spinosa Roxb. ex Link, Jahrb. Gewächsk. **3**: 32 (1820)–Robyns, l.c. 230 (1928).

Vangueria spinosa Roxb., Fl. Ind. ed. 2, **1**: 536 (1832)–Kurz, For. Fl. Burma **2**: 341 (1877)–Fl. Brit. Ind. **3**: 136 (1880), p. p.–Haines, Bot. Bihar Orissa **4**: 439 (1922)–Pitard, l.c. **3**: 301 (1924).

Dhara Pani-Illam, 1500–1200 m (Dec. 5, 1963, fr.).

Distr. Himalaya, India, Burma, and Indo-China.

Mitragyna parvifolia Korthals, Obs. Naucl. Ind. 19 (1839)–Gamble, Fl. Madras **2**: 413 (1921).

Stephegyne parvifolia Korthals, Verh. Nat. Gesch. Nederl. 161 (1839–42)–Fl. Brit. Ind. **3**: 25 (1880).

Rangali-Biratnagar, 200 m (Dec. 15, 1963, fr.).

Distr. India.

Morinda angustifolia Roxb. [Hort. Beng. 15 (1814), nom. nud.] Pl. Corom. **3**: 32, t. 237 (1815)–Fl. Brit. Ind. **3**: 156 (1880)–Haines, Bot. Bihar Orissa **4**: 424 (1922)–Kar & Panigrahi, l.c. 232 (1963).

Rayang, Darjeeling, 250 m (Apr. 21, 1960, fl.); Peshok, 900 m (Apr. 27, 1960, fl.); Siliguri-Kurseong, (Apr. 29, 1960, fl.).

Distr. E. Himalaya (Nepal, Sikkim), Assam, and Burma.

Mussaenda glabra Vahl, Symb. **3**: 38 (1790)–Fl. Brit. Ind. **3**: 90 (1880)–Jayaweera in Journ. Arn. Arb. **44**: 262 (1963), excl. specim. Ryukyu.

Kalimpong, 1350 m (Apr. 23, 1960).

Distr. E. Himalaya (Nepal, Sikkim), Assam, Burma, and Indo-China.

Mussaenda Roxburghii Hooker f., Fl. Brit. Ind. **3**: 38 (1880)-Kar & Panigrahi, l.c. 232 (1963).

Pamianchi–Tingling Bridge, 1000–200 m (May 15, 1960); Gangtok–Rongpo, 400 m (Jun. 18, 1960); Dhara Pani–Dhankuta, 900–1200 m (Oct. 17, 1963,); Ranga Pani-Ghorwa, 700–300 m (Dec. 9, 1963); Ghorwa-Sanichare, 200 m (Dec. 10, 1963).

Distr. E. Himalaya (Nepal to Bhutan), Assam, Khasia, and Burma.

Mussaenda Treutleri Stapf in Bot. Mag. t. 8254 (1909)–Jayaweera, l.c. **44**: 247 (1963).

M. frondosa L. var. *grandiflora* Hooker f., Fl. Brit. Ind. **3**: 90 (1880).

Taplethok-Helok, 1300–1500 m (Nov. 6, 1963, fr.); Bhandukay–Ghatte, 2400–1600 m (Nov. 16, 1963, fr.); Ghatte, 1600 m (Nov. 17, 1963, fr.); Yektin, 1100 m (Nov. 29, 1963, fr.).

Distr. Himalaya (Kumaon to Bhutan), and Khasia.

Mycetia longifolia (Wall.) O. Kuntze, Rev. Gen. Pl. 289 (1891).

Rondeletia longifolia Wall. in Roxb., Fl. Ind. ed. Carey, **2**: 137 (1824).

Bertiera javanica Blume, Bijdr. 987 (1825).

Adenosacme longifolia Wall. ex Hooker f., Fl. Brit. Ind. **3**: 95 (1880)–Kar & Panigrahi, l.c. 227 (1963).

Pamianchi-Tingling Bridge, 1000–1200 m (May 15, 1960, fl.); Taplethok-Helok, (Nov. 19, 1963, fr. white); Khebang-below Siling Tzokupa, 1700–2100 m (Nov. 20, 1963, fr. white); Khebang-Bharomdin, 1700–1000 m (Nov. 24, 1963); Illam-Ranga Pani, 1200–700 m (Dec. 8, 1963, fr.).

Distr. Himalaya, India, Burma, Indo-China, Malaya, and Java.

Neanotis calycina (Wall. ex Hook. f.) W. H. Lewis in Ann. Miss. Bot. Gard. **53**: 37 (1966).

Anotis calycina Wallich ex Hooker f., Fl. Brit. Ind. **3**: 73 (1880)–S. K. Kar & G. Panigrahi in Bull. Bot. Surv. India **5**: 227 (1963).

Rayang, Darjeeling, 250 m (Apr. 21, 1960); Darjeeling, 2100 m (Sep. 10, 1964, fl. white); Godavari, near Kathmandu, 1600 m (Sep. 18, 1963, fr.); Pouwa, Kathmandu, 1600 m (Oct. 9, 1963, fr.); Ghatte-Khebang, 1600–1700 m (Nov. 19, 1963).

Distr. Himalaya (Kashmir to Bhutan), Assam, Indo-China, and W. China (Yunnan, Szechuan).

Neanotis gracilis (Hook. f.) W. H. Lewis, l.c. 38 (1966).

Anotis gracilis Hook. f., Fl. Brit. Ind. **3**: 71 (1880).

Gangtok, 1650 m (Jun. 15, 1960,); Zalipur, below Gangtok, 1000 m, (Sep. 12, 1964); Taplejung-Garhi Danra, 2000–2200 m (Nov. 3, 1963, fr.); Tuwa-Taplethok, 1800–1300 m (Nov. 5, 1963, no. 1277); Mai Majuwa-Dhara Pani, 1600–1500 m (Dec. 4, 1963, fl.).

Distr. E. Himalaya (Nepal, Sikkim), and Khasia.

Neanotis ingrata (Wall. ex Hook. f.) W. H. Lewis, l.c. 39 (1966).

Anotis ingrata Wallich ex Hooker f., Fl. Brit. Ind. **3**: 71 (1880)– Kar & Panigrahi, l.c. 227 (1963).

Gangtok-Saramsa, 800–1600 m (Jun. 17, 1960); Sunderijal Waterfall, near Kathmandu, 1600 m (Sep. 20, 1963); Sinduwa, 1100 m (Oct. 24, 1963); Taplejung, 1700 m (Nov. 2, 1963,); Mai Majuwa-Dhara Pani, 1600–1500 m (Dec. 4, 1963).

Distr. E. Himalaya (Nepal to NEFA), Assam, S. Tibet, Indo-China (Tonkin), and W. China (Yunnan, Szechuan).

Neanotis Wightiana (Wall. ex Wight et Arn.) W. H. Lewis, l.c. 40 (1966).

Hedyotis Wightiana Wall. ex Wight et Arn., Prodr. Fl. Ind. Or. 410 (1834).

Anotis Wightiana Wall. ex Hooker f., Fl. Brit. Ind. **3**: 75 (1880)–D. R. Fyson, Fl. S. Ind. Hill State 276, t. 233 (1932)–Kar & Panigrahi, l.c. 228 (1963).

Gangtok, 1700 m (Jun. 15, 1960); Penlong La, Gangtok, 2100 m (Jun. 16, 1960); Thakma Khola-Bhandukay, 3200–2400 m (Nov. 14, 1963); near Chyangthaphu-Birwa, (Nov. 27, 1963).

Distr. Himalaya, and India.

Ophiorrhiza fasciculata D. Don, Prodr. Fl. Nepal 136 (1825)–Fl. Brit. Ind. **3**: 83 (1880).

Dentam-Pamianchi, 1500–200 m (May 12, 1960, fl.); Tista Bazar, Darjeeling, 300 m (Jun. 20, 1960, fl.); Pouwa, Kathmandu, 1600 m (Oct. 9, 1963, fl. white); Gokarna forest, northwest of Kathmandu, 1500 m (Sep. 22, 1963); Minchin Dhap-Mul Pokhari, 2800–2400 m (Oct. 29, 1963); Zalipur, Gangtok, 1000 m (Sep. 12, 1964, fl.); Namli, 900 m (Sep. 12, 1964, fl. white).

Dist. Himalaya (Garhwal to Bhutan), and Khasia.

Ophiorrhiza prostrata D. Don, Prodr. Fl. Nepal. 136 (1825).

Ophiorrhiza Harrisiana Heyne var. *rugosa* (Wall.) Hooker f., Fl. Brit. Ind. **3**: 78 (1880).

Ophiorrhiza rugosa Wall., Cat. 6229 (1828), nom. nud.–King in Journ. Asia. Soc. Beng. **72**: 175 (1903).

Gatribas, Darjeeling, 2800 m (Sep. 16, 1964); Pouwa, Kathmandu, 1600 m (Oct. 9, 1963); Godavari, near Kathmandu, 1500 m (Sep. 18, 1964).

Distr. E. Himalaya (Nepal, Sikkim).

Ophiorrhiza succrirubra King ex Hooker f., Fl. Brit. Ind. **3**: 82 (1880).

Kurseong (Apr. 12, 1960); Birwa-Yektin, 2400–1700 m (Nov. 28, 1963); below Yektin-Akasay, 1400–2300 m (Nov. 30, 1963).

Distr. E. Himalaya (Nepal, Sikkim).

Ophiorrhiza Thomsonii Hooker f., Fl. Brit. Ind. **3**: 82 (1880).

Gangtok, 1650 m (Jun. 14, 1960).

Distr. E. Himalaya (Sikkim, Bhutan).

Ophiorrhiza Treutleri Hooker f., Fl. Brit. Ind. **3**: 83 (1880).

Takdah, Darjeeling, 600–1700 m (Apr. 19, 1960); Tingling Bridge–Yoksam, 1000–1700 m (May 16, 1960); Gangtok, 1600 & 1900 m (Jun. 15, 1960); Observatory Hill, Darjeeling, 2150 m (Sep. 12, 1964); Birch Hill, Darjeeling, 2100 m (Sep. 21, 1964, fl. white and tube pinkish).

Distr. E. Himalaya (Sikkim), and Khasia.

Paederia foetida L., Mant. Pl. **1**: 52 (1767)–Fl. Brit. Ind. **3**: 195 (1880)–Kar & Panigrahi, l.c. 234 (1963).

Phusri–Dhara Pani, 500–900 m (Oct. 16, 1963); Dhara Pani–Dhankuta, 500–1200 m (Oct. 17, 1963); Tharpu-Chyangthaphu, 1200-1300 m (Nov. 26, 1963); Illam–Ranga Pani (Dec. 8, 1963).

Distr. Himalaya, C. & E. India, Malay, and Indo-China.

Paederia scandens (Lour.) Merrill in Contr. Arn. Arb. **8**: 163 (1934)–Hara, Enum. Sperm. Jap. **2**: 24 (1952).

Gentiana scandens Loureiro, Fl. Cochinch. **1**: 171 (1790).

Paederia tomentosa Blume, Bijdr. 968 (1826)–Fl. Brit. Ind. **3**: 197 (1880)–Kar & Panigrahi, l.c. 234 (1963).

Garhi Danra–Tuwa, 2200–1800 m (Nov. 4, 1963).

Distr. E. Himalaya, Khasia, Burma, Indo-China, Malaya, Philippines, China, and Japan.

Pavetta indica L., Sp. Pl. ed. 1, **1**: 110 (1753)–Fl. Brit. Ind. **3**: 150 (1880)–Bremekamp, l.c. 118 (1934).

Pamianchi-Tingling Bridge, 1000–200 m (May 15, 1960); Khebang-Bharomdin, 1700–1000 m (Nov. 24, 1963, fr. black).

Distr. Himalaya and India.

Pavetta tomentosa Roxburgh ex Smith in Rees, Cyclop. 26, no. 2 (1819)–Bremekamp in Fedde, Rep. **37**: 113 (1934).

Ixora tomentosa Roxb., Hort, Beng. 11 (1814), nom. nud.

Pavetta tomentosa Roxb. var. *Roxburghii* Kurz in For. Fl. Burm. **2**: 19 (1877)–Bremekamp, l.c. 114 (1934).

Pavetta indica L. var. *tomentosa* (Roxb.) Hooker f., Fl. Brit. Ind. **3**: 150 (1885).

Dhara Pani–Dhankuta, 900–1200 m (Oct. 17, 1963); Khebang-Bharomdin, 1700–

1000 m (Nov. 24, 1963); below Yektin, 1400 m (Nov. 29, 1963); Yektin-Akasay, 1400–2300 m (Nov. 30, 1963); Ranga Pani–Ghorwa, 700–200 m (Dec. 9, 1963); Gorwa-Sanichare, 300–200 m (Dec. 10, 1963).

Distr. Himalaya, India, and Indo-China.

Psychotria erratica Hooker f., Fl. Brit. Ind. **3**: 168 (1880)–Kar & Panigrahi, l.c. 235 (1963).

Takdah, Darjeeling, 1600–1700 m (Apr. 8, 1960); Yoksam-Bakkim, 1700–2200 m (May 18, 1960); Birch Hill, 2000 m (Jun. 18, 1960); Ranga Pani–Ghorwa, 700–300 m (Dec. 9, 1963, fr. yellowish).

Distr. E. Himalaya (Nepal to Bhutan), and Assam.

Rubia charaefolia Wall. ex G. Don, Gen. Hist. **3**: 643 (1834)–Airy-Shaw in Kew Bull. **1931**: 451 (1931).

R. angustissima Wall. sensu Fl. Brit. Ind. **3**: 203 (1881), p.p.

Kalimpong, 1300 m (Apr. 24, 1960, fr.); Dhankuta, 1200 m (Oct. 19, 20 & 21, 1963, fl. & fr.).

Distr. E. Himalaya (Nepal to Bhutan).

Rubia Manjith Roxburgh ex Fleming in Asiat. Research. **11**: 177 (1810)–Hara et Kurosawa in Sci. Rep. Tohoku Univ. Biol. **29**: 259 (1963). [Pl. 5 d]

R. Mungith Roxb. ex Desvaux, Journ. de Bot. **1814** (2): 207 (1814).

R. Munjista Roxburgh, Fl. Ind. ed. Carey, **1**: 383 (1820); ed. 2, **1**: 374 (1832)–Wight, Icon. **1**: t. 187 (1840).

R. cordifolia L. *β. Mungista* (Roxb.) Miq. in Ann. Mus. Bot. Lugd.-Bat. **3**: 111 (1867), quoad syn.

R. cordifolia L. sensu Hook. f., Fl. Brit. Ind. **3**: 202 (1881), p.p.

R. cordifolia var. *Munjista* f. *rubra* Kitamura, Faun. & Fl. Nepal Himal. 232 (1955), nom. in observ.

Darjeeling, 1900–2150 m (Apr. 2 & 7, Jun. 24, 1960; Mar. 16, Dec. 25 & 28, 1963; Sep. 15, 1964, fl. & fr.); Gangtok, 1500–1700m (Jun. 13, 1960, fl.; Mar. 24, 1963, fr.); Namchi–Damthang, 2000 m (Mar. 27, 1963, fr.); Godavari, 1500 m (Sep. 18, 1963, bud); Kakani, 2100 m (Sep. 24, 1963, fl.); below Nissim, 1300 m (Oct. 30, 1963, fl.); below Taplejung, 1700 m (Oct. 31 & Nov. 2, 1963, fl.); Yamphodin–Ghatte, 1700 m (Nov. 16, 1963, fr.); Mai Pokhari, 1600 m (Dec. 4, 1963, fr.).

Distr. Himalaya (Simla to Bhutan), and Khasia.

Regarding the *Rubia cordifolia* group, see page 652.

Rubia sikkimensis Kurz in Journ. Asia. Soc. Beng. **43** (2): 188 (1874)–Fl. Brit. Ind. **3**: 203 (1881).

Below Yektin, 1400 m (Nov. 29, 1963, fl.); Yektin–Akasay, 1500 m (Nov. 30, 1963, fl.); Chisa Pani, 600 m (Dec. 9, 1963, fl.).

Distr. E. Himalaya (Nepal to Bhutan), N. Assam, Naga Hills, and Manipur.

Rubia Wallichiana Decaisne, Recher. Garance 61 (1837).

R. cordifolia L. sensu Hook. f., Fl. Brit. Ind. **3**: 202 (1881), p.p.

R. cordifolia var. *Munjista* Miq. sensu Kitamura, l.c. 231 (1955).

Garibans–Tonglu, 2800–3000 m (Jun. 7, 1960, no. 690, fl.); Darjeeling, 2100 m (Jun. 21, 1960); Godavari, Kathmandu, 1500 m (Sep. 18, 1963, fl. dark purple); Sinduwa–Chitray, 2100 m (Oct. 24, 1963, fl.); Bilbatay Bhanjang, 2200 m (Oct. 25, 1963, fl.); Bilbatay Bhanjang–Hati Sar, 2200–2900 m (Oct. 27, 1963, fl. & fr.); Minchin Dhap–

Mul Pokhari, 2900–2500 m (Oct. 29, 1963, fl. yellowish); Gorzu Kosir, 2000 m (Oct. 30, 1963, fl. yellowish green); Iladanda–Selap, 1800–2600 m (Nov. 9, 1963); Selap–Walunchung, 2600–3800 m (Nov. 10, 1963, fr.); Helok–Baroya Khimty, 1500–2500 m (Nov. 10, 1963, fr.); Thakma Khola–Bhandukay, 2500–3500 m (Nov. 17, 1963, fr.); Siling Tzokupa, 2500–3100 m (Nov. 21, 1963, fr.); Batasay–Bhuspate Danra, 2400–2900 m (Dec. 1, 1963); Bhuspate Danra–Mai Majuwa, 2000–3100 m (Dec. 3, 1963, fr.); Lagyap, 2200 m (Sep. 13, 1964, fl.); Kala Pokhari–Sandakphu, 3000–3500 m (Sep. 16, 1964, fl. dark purple).

Distr. Himalaya (Punjab to Bhutan), and Khasia.

Spermadictyon suaveolens Roxb., Pl. Corom. **3**: 32, t. 236 (1815)–Kar et Panigrahi, l.c. 236 (1963).

Hamiltonia suaveolens Roxb. [Hort. Beng. 15 (1814), nom. nud.] Fl. Ind. ed. Carey, **2**: 223 (1824)–Fl. Brit. Ind. **3**: 197 (1880).

Spermadictyon azureum Wall. ex Roxb., Fl. Ind. ed. Carey, **2**: 225 (1824).

Dumhan–Taplejung, 700–2000 m (Nov. 1, 1963, fl.); below Siling Tzokupa–Khebang, 2100–1700 m (Nov. 22, 1963, fl. bluish white); Khebang–Bharomdin, 1700–1000 m (Nov. 24, 1963, fl. bluish violet); Birwa–below Yektin, 2700–1400 m (Nov. 28, 1963); below Yektin, 1400 m (Nov. 29, 1963, fl.); Dhara Pani–Illam, 1500–1200 m (Dec. 5, 1963); Illam, 1200 m (Dec. 6, 1963, fl.).

Distr. Himalaya, and India.

Uncaria pilosa Roxb., Fl. Ind. ed. 2, **1**: 520 (1832)–Fl. Brit. Ind. **3**: 32 (1880)–Havil. in Journ. Linn. Soc. **33**: 88 (1897)–Kar & Panigrahi, l.c. 236 (1963).

Ghorwa–Sanichare, 300–200 m (Dec. 10, 1963).

Distr. Himalaya (Kumaon to Sikkim), Assam, Khasia, Burma, and Indo-China.

Uncaria sessilifructus Roxb., Fl. Ind. ed. 2; **1**: 520 (1832)–Fl. Brit. Ind. **3**: 30 (1880)–Havil., l.c. 90 (1897)–Kar & Panigrahi, l.c. 236 (1963).

Peshok, Darjeeling, 900 m (Apr. 27, 1960); Tharpu–near Chyangthaphu, 1200–1100 m (Nov. 26, 1963); Ghorwa–Sanichare, 300–200 m (Dec. 10, 1963).

Distr. E. Himalaya (Nepal to Bhutan), Khasia, Assam, Burma, and Indo-China.

Wendlandia coriacea DC., Prodr. **4**: 412 (1830)–Fl. Brit. Ind. **3**: 39 (1880)–Cowan in Not. Bot. Gard. Edinb. **16**: 270 (1928).

Sunderijal Waterfall, near Kathmandu, 1500 m (Sep. 20, 1963); Dumhan–Taplejung, 700–2000 m (Nov. 1, 1963); Khebang–Bharomdin, 1700–1000 m (Nov. 24, 1963).

Distr. E. Himalaya (Nepal, Sikkim).

Wendlandia sikkimensis Cowan in Not. Bot. Gard. Edinb. **16**: 246 (1928).

Dentam–Pamianchi, 1450–2000m (May 12, 1960); Pamianchi–Tingling Bridge, 2000–1000m (May 15, 1960); Tuwa–Taplethok, 1800–1300 m (Nov. 5, 1963); Taplethok–Helok, 1300–1500 m (Nov. 6, 1963); Helok, 1500m (Nov. 8, 1963); Iladanda–Helok, 1800–1500 m (Nov. 13, 1963); Thakma Khola–Bhandukay, 3200–2400m (Nov. 14, 1963); Ghatte, 1600 m (Nov. 17, 1963); Sibganja–Gauriganja, 200 m (Dec. 12, 1963).

Distr. E. Himalaya (Nepal, Sikkim), and Bengal.

Xeromphis spinosa (Thunb.) Keay in Bull. Jard. Bot. Brux. **28**: 37 (1958)–J. K. Maheshwari in Bull. Bot. Surv. Ind. **3**: 91 (1961).

Gardenia spinosa Thunberg, Diss. Gard. no. 7 (1780).

Gardenia dumetorum Retz., Obs. Bot. **2**: 14 (1781).

Randia dumetorum (Retz.) Poir. in Lamk., Encycl. Suppl. **2**: 829 (1811)–Fl. Brit. Ind. **3**: 110 (1880).

Randia spinosa (Thunb.) Poir., in Lamk., Encycl. Suppl. **2**: 829 (1811).

Gardenia longispina Roxburgh, Hort. Beng., 15 (1814), nom. nud.

Randia longispina (Roxb.) DC., Prodr. **4**: 386 (1830)–Wight & Arnott, Prodr. Fl. Ind. Or. 389 (1834).

Ranga Pani–Ghorwa, 700–300 m (Dec. 9, 1963); Kathgara–Rangali, 200 m (Dec. 14, 1963).

Distr. India.

CAPRIFOLIACEAE (by Hiroshi Hara)

Leycesteria formosa Wallich in Roxburgh, Fl. Ind. ed. Carey, **2**: 181 (1824)–Wall., Pl. Asia. Rar. **2**: t. 120 (1831)–Fl. Brit. Ind. **3**: 16 (1880).

Ramam, 2400 m (May 8, 1960, fl.); Minchin Dhap–Mul Pokhari, 2900–2500 m (Oct. 29, 1963, fr.); Iladanda–Selap, 1800–2600 m (Nov. 9, 1963); Walunchung Gola–Zongi, 3800–2800 m (Nov. 11, 1963, fr.); Baroya Khimty, 2400–2500 m (Nov. 10 & 11, 1963, fr.); Thakma Khola, 2500–2800 m (Nov. 12 & 16, 1963, fr.); Diorali Bhanjang–Bhandukay, 2900 m (Nov. 14, 1963, fr.); below Siling Tzokupa, 2300 m (Nov. 21, 1963, fr.).

Distr. Himalaya (Kashmir to Sikkim), Khasia, SE. Tibet, N. Burma, and W. China.

Leycesteria glaucophylla (Hook. f. et Thoms.) Hook. f. in Fl. Brit. Ind. **3**: 16 (1880), excl. diagn.

Lonicera glaucophylla Hook. f. et Thoms. in Journ. Linn. Soc. **2**: 165 (1858).

L. Belliana W. W. Smith in Trans. Bot. Soc. Edinb. **24**: 173, t. 13 (1911).

Bakkim, 2500 m (May 19, 1960, no. 427, fr. juv.); Diorali Bhanjang–Bandukay, 2900–3000 m (Nov. 14, 1963); below Siling Tzokupa, 2300 m (Nov. 21, 1963).

Distr. E. Himalaya (E. Nepal, Sikkim), and N. Burma.

Leycesteria gracilis (Kurz) Airy-Shaw in Hooker, Icon. Pl. ser. 5, **2**: t. 3166 (May 1932); in Kew Bull. **1932**: 174 (Jun. 13, 1932)–Merrill in Brittonia **4**: 177 (1941).

Lonicera gracilis Kurz in Journ. Asia. Soc. Beng. **39** (2): 77 (1870).

Leycesteria glaucophylla Hook. f. sensu C. B. Clarke in Fl. Brit. Ind. **3**: 16 (1880), p.p.

Batasi–Palmajua, 2300–2600 m (May 3, 1960, no. 73, fr.).

Distr. E. Himalaya (Sikkim, Bhutan), N. Burma, and W. China (Yunnan).

Airy-Shaw in 1932 established the subgenus Paralestera based on *L. gracilis* attaching special importance to its 7–8-celled ovaries. Our specimen (no. 73) with immature fruits agrees well with *L. gracilis* in having glabrous leaves, no stipules, elongate axillary inflorescences with flowers in pair, small lanceolate bracts, small calyx-lobes, and glabrous ovaries, but its ovaries are clearly 5-locular (Fig. 24) as in other species of

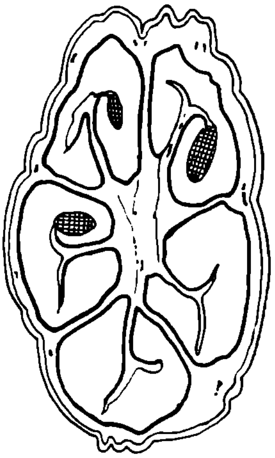

Fig. 24. Cross section of the ovary of *Leycesteria gracilis* Airy-Shaw.

the genus. I have also examined an authentic specimen from Chota Rimitti (Gamble, no. 7451) identified by Airy-Shaw as *L. gracilis* by courtesy of the director of Royal Botanic Gardens, Kew, and a specimen from Sukia Pokri (Biswas, 1949 in KYO), and I have confirmed that both of them have 5-celled ovaries too. So the number of ovary-cell mentioned by Airy-Shaw seems to be abnormal even in this species, and the subgenus cannot be distinguished from others by this character.

Leycesteria stipulata (Hook. f. et Thoms.) Fritsch in Engl., Pfl.-fam. IV, **4**: 169 (1891).

Lonicera stipulata Hook. f. et Thomson in Journ. Linn. Soc. **2**: 165 (1858).

Pentapyxis stipulata (Hook. f. et Thoms.) Hook. f., Fl. Brit. Ind. **3**: 17 (1880).

Ghum, 2300 m (Apr. 4, 1960, fl; Jun. 22, 1960, fr.); Darjeeling, 2100 m (Jun. 21, 1960, fr.).

Distr. E. Himalaya (Sikkim), N. Burma, and W. China (NW. Yunnan).

Lonicera acuminata Wallich in Roxburgh, Fl. Ind. ed. Carey, **2**: 176 (1824)–Fl. Brit. Ind. **3**: 10 (1880)–Rehder in Ann. Rep. Miss. Bot. Gard. **14**: 150 (1903)–Fl. Males. **4**: 178 (1951)–Li, Wood. Fl. Taiwan 886, f. 359 (1963).

Garibans–Tonglu, 2800–3000 m (Jun. 7, 1960, bud); Bilbatay Bhanjang–Hati Sar, 2400–2900 m (Oct. 27, 1963, fr.); Hati Sar–Minchin Dhap, 2700–2900 m (Oct. 28, 1963, fr.); Baroya Khimty–Thakma Khola, 2700 m (Nov. 12 & 16, 1963, fr.); Bhuspate Danra, 2600 m (Dec. 2, 1963, fr.); Gangtok, 1500 m (Mar. 18, 1963).

Distr. E. Himalaya (Nepal, Sikkim), Malaysia, S. China, and Formosa.

Lonicera angustifolia Wallich ex DC., Prodr. **4**: 337 (1830)–Fl. Brit. Ind. **3**: 13 (1880)–Rehder, l.c. 45 (1903).

Phalut, 3500 m (Jun. 5, 1960, bud); Sandakphu–Phalut, 3300–3600 m (May 8, 1960, bud).

Distr. Himalaya (Kashmir to Sikkim).

Lonicera glabrata Wallich in Roxburgh, Fl. Ind. ed. Carey, **2**: 175 (1824)–Fl. Brit. Ind. **3**: 10 (1880)–Rehder, l.c. 148 (1903).

Sinduwa–Chitray, 2100–2300 m (Oct. 24, 1963, fl., fr.); Minchin Dhap–Mul Pokhari, 2900–2500 m (Oct. 29, 1963, fl.); Ghatte–Khebang, 1600–2400 m (Nov. 19, 1963, fr.); Birwa–below Yektin, 2400–1400 m (Nov. 28, 1963, fl.); Helok–Baroya Khimty, 1500–2500 m (Nov. 10, 1963, fr.).

Distr. E. Himalaya (Nepal to Bhutan), and Manipur.

Lonicera japonica Thunberg, Fl. Jap. 89 (1784)–Hara, Enum. Sperm. Jap. **2**: 43 (1952).

Kathmandu, cult., 1400 m (Sep. 17, 1963, fl.).

Distr. China, Korea, and Japan.

Lonicera macrantha (D. Don) Sprengel, Syst. Veg. **4** (2): 82 (1827)–Rehder, l.c. 154 (1903).

Caprifolium macranthum D. Don, Prodr. Fl. Nepal. 140 (1825).

Lonicera macrantha (D. Don) DC., Prodr. **4**: 333 (1830)–Fl. Brit. Ind. **3**: 10 (1880).

Pamianchi–Tingling Bridge, 2000–1000 m (May 15, 1960, fl.); above Helok, 1600 m (Nov. 8, 1963).

Distr. E. Himalaya (Nepal to Bhutan), Khasia, S. China, and Formosa.

Lonicera obovata Royle ex Hook. f. et Thomson in Journ. Linn. Soc. **2**: 169 (1858)-Fl. Brit. Ind. **3**: 14 (1880)-Rehder, l.c. 56 (1903).

Jongri-Olothang, 3900 m (May 23, 1960, no. 463, fl.); Jongri-Gamothang, 4200-3600 m (May 27, 1960).

Distr. Afghanistan, and Himalaya (Kashmir to Sikkim).

Our specimens differ from the typical form by larger foliaceous bracts and the absence of bracteoles.

Sambucus adnata Wallich ex DC., Prodr. **4**: 322 (1830)-Fl. Brit. Ind. **3**: 3 (1880)-Schwerin in Mitt. Deuts. Dendr. Ges. **18**: 191 (1909); **29**: 221 (1920)-Rehder in Pl. Wilson. **1**: 308 (1913).

Phalut-Sandakphu, 3500 m (Jun. 6, 1960, no. 679, bud); Sandakphu-Garibans (Jun. 7, 1960, bud); Sinduwa, 2100 m (Oct. 24, 1963, fr. red); above Tutay, 2700 m (Oct. 26, 1963, fr. red); Hati Sar-Minchin Dhap, 2700-2900 m (Oct. 28, 1963, fr.).

Distr. E. Himalaya (Nepal to Bhutan), Khasia, S. Tibet, and W. China (Yunnan, Szechuan).

Sambucus canadensis L., Sp. Pl. ed. 1, **1**: 267 (1753)-Schwerin, l.c. 185 (1909); l.c. 215 (1920)-Fl. Males. **4**: 192 (1951).

S. Eberhardtii P. Danguy in Bull. Mus. Hist. Nat. **28**: 378 (1922)-Fl. Gén. Ind.-Chin. **3**: 4, f. 1, 3-5 (1922).

S. mexicana Presl sensu Corner, Wayside Tr. Malaya 182, t. 40 (1940).

S. mexicana var. *bipinnata* Schw. sensu Fosberg in Occ. Pap. Bishop. Mus. **23**: 43 (1962).

Takdah, cult. 1600 m (Apr. 19, 1960, no. 2173, bud); Kalimpong, cult., 1000 m (Jun. 20, 1960, fl., fr.); Kathmandu, cult., 1400 m (Sep. 17, 1963, fl.); Dhara Pani-Illam (Dec. 5, 1963, fl., fr.); Illam, cult., 1200 m (Dec. 6, 1963, fl.).

Distr. SW. N. America, and C. America; sometimes planted in Asia.

Sambucus Hookeri Rehder in Pl. Wilson. **1**: 308 (1913)-Schwerin, l.c. **29**: 222 (1920).

S. javanica Reinwardt sensu Fl. Brit. Ind. **3**: 2 (1882), p.p.-Schwerin, l.c. **18**: 191 (1909), p.p.

Kalimpong, 1300 m (Jun. 20, 1960, fl.); Garhi Danra, 2200 m (Nov. 3, 1963, fr. greenish white); Ghatte-Khebang, 1600-2400 m (Nov. 19, 1963, fr.); Yektin-Akasay, 1600-2400 m (Nov. 30, 1963, fr.).

Distr. E. Himalaya (Nepal to NEFA), and Assam.

Viburnum cordifolium Wallich [Cat. no. 462 (1829), nom. nud.] ex DC., Prodr. **4**: 327 (1830)-Fl. Brit. Ind. **3**: 6 (1880)-Rehder in Sargent, Tr. & Shr. **2**: 81, t. 138 (1908).

Nayathang-Phalut, 3300-3500 m (Jun. 2, 1960, no. 774, bud); Preig Chu-Jongri, 2200-4000 m (May 19, 1960, no. 389, fl.), Phalut-Chia Bhanjang, 3600-3100 m (May 11, 1960, fl.); Sandakphu-Phalut, 3300-3600 m (May 8, 1960, bud); Diorali Bhanjang, 3000 m (Nov. 14, 1963); Bhuspate Danra, 2600 m (Dec. 2, 1963).

Distr. E. Himalaya (Kumaon to Bhutan), and W. China (Szechuan, Yunnan).

Viburnum coriaceum Blume, Bijdr. 656 (1826)-Fl. Brit. Ind. **3**: 5 (1880)-Kern in Reinwardt. **1**: 115 (1951)-Fl. Males. **4**: 183, f. 4 a-f (1951).

V. cylindricum Hamilton sensu Rehder in Sargent, Tr. & Shr. **2**: 91, t. 143 (1908); Bibl. 605 (1949).

Kakani, 2100 m (Sep. 24, 1963, fr.); Mul Pokhari–Nissim, 1300–2100 m (Sep. 30, 1963, fr.); Taplejung–Garhi Danra, 1900–2200 m (Nov. 3, 1963, fr.); Garhi Danra–Tuwa, 2200–1800 m (Nov. 4, 1963, fr.); Helok–Lelep, 1800–2600 m (Nov. 9, 1963, fr.); Ghatte, 1300 m (Nov. 17, 1963, fr.); below Siling Tzokupa (Nov. 21, 1963, fr).

Distr. Himalaya (Kumaon to Bhutan), Khasia, Manipur, N. Burma, Indonesia, and W. China (east to W. Hupeh).

Viburnum erubescens Wallich ex DC., Prodr. **4**: 329 (1830)–Wallich, Pl. Asia. Rar. **2**: 29, t. 134 (1831)–Fl. Brit. Ind. **3**: 7 (1880)–Rehder in Sargent, Tr. & Shr. **2**: 107 (1908).

Garibans–Tonglu, 2800–3000 m (Jun. 7,1960, fl.); near Chia Bhanjang, 3300–3500 m (Jun. 2, 1960, no. 746, fl.); Palmajua–Rimbick, 2200–2300 m (May 5, 1960, fl.); Senchal, 2400 m (Jun. 23, 1960, fr.); Yoksam, 1700 m (May 17, 1960, fr.); Mani Bhanjang–Batasi, 2000 m (May, 1, 1960, fl.); Ghum–Kurseong, 1600–2200 m (Jun. 22, 1960, fr.).

var. **Wightianum** (Wall.) Fyson, Fl. Nilgiri & Pulney **1**: 182 (1915); **3**: t. 354 (1920), ut *Wightiana*.

V. Wightianum Wallich, l.c. 29 (1831)–Wight, Icon. **3** (3): 14, t. 1024 (1845).

?*V. pubigerum* Wight et Arn., Prodr. 389 (1834).

Takdah, 1600 m (Apr. 18, 1960, no. 1982, fl.); Chia Bhanjang–Dentam, 3100–1500 m (May 11, 1960, no. 180, fl.); Batasi, 2000 m (May 2, 1960, no. 34, bud); Palmajua–Rimbick, 2200–2300 m (May 5, 1960, young fr.).

Distr. sp. Himalaya (Kumaon to NEFA), India, Ceylon, N. Burma, and W. & C. China.

The species has the same peculiar smell as that of *V. Sieboldi* Miquel of Japan, when bruised.

This variety occurs at lower elevations and becomes a larger tree. Its leaves are thinner, broader, oval, its panicles larger, loose, and drooping, and its flowers yellowish. The serration of leaves varies from minute to coarse. A few specimens closely resemble var. *gracilipes* Rehder of central China.

Viburnum Mullaha Hamilton in D. Don, Prodr. Fl. Nepal. 141 (1825)–Rehder in Sargent, Tr. & Shr. **2**: 115 (1908).

V. stellulatum Wallich ex DC., Prodr. **4**: 327 (1830)–Wallich, Pl. Asia. Rar. **2**: 54, t. 169 (1831)–Fl. Brit. Ind. **3**: 4 (1880).

Sandakphu–Garibans, 3000–2800 m (Jun. 7, 1960, bud); Bilbatay Bhanjang, 2200 m (Oct. 24, 1963, fr.); Minchin Dhap–Mul Pokhari (Oct. 29, 1963, fr.); Bhuspate Danra, 2900 m (Dec. 2, 1963, fr. red).

Distr. Himalaya (Kashmir to NEFA), and Indo-China.

Viburnum punctatum Hamilton ex D. Don, Prodr. Fl. Nepal. 142 (1825)–Fl. Brit. Ind. **3**: 5 (1880)–Kern in Reinwardt. **1**: 127 (1951).

V. acuminatum Wallich ex DC., Prodr. **4**: 325 (1830)–Wight, Icon. **3**: t. 1021 (1845).

Sunderijal Waterfall, Kathmandu, 1600 m (Sep. 20, 1963, fr.).

Distr. Himalaya (Kumaon, Nepal), Deccan, Thai, Indo-China, and N. Sumatra.

VALERIANACEAE (by Hiroshi Hara)

Valeriana Hardwickii Wallich in Roxburgh, Fl. Ind. ed. Carey, **1**: 166

(1820)–Fl. Brit. Ind. **3**: 213 (1881)–Hand.-Mzt. in Act. Hort. Gothob. **9**: 174 (1934)–Backer in Fl. Males. **4**: 254 (1951).

Darjeeling, 1900–2100 m (Jun. 26, 1960, fl.; Sep. 16, 1964, fr.); Senchal, 2350 m (Dec. 27, 1963, fr.); Kakani, 2100–2200 m (Sep. 24, 1963, fl.); Sanguri Bhanjang, 1200 m (Oct. 16, 1963, fl.); Sinduwa, 2100 m (Oct. 23 & 24, 1963, fl., fr.); Murhay, 2000 m (Oct. 23, 1963, fr.); Bilbatay Bhanjang, 2200 m (Oct. 25, 1963, fr.); Minchin Dhap–Mul Pokhari, 2900–2500 m (Oct. 29, 1963, fr.); Baroya Khimty–Thakma Khola, 2500–3000 m (Nov. 12, 1963, fr.); Halhale Bhanjang, 2700 m (Dec. 1, 1963, fl.).

Distr. Himalaya (Kashmir to NEFA), Khasia, N. Thai, Indo-China, W. China, Sumatra, and Java.

In our collections, the plants are nearly glabrous in the upper part except for pilose nodes, the flowers are white and 2–2.5 mm across, and the fruits are minutely pubescent or glabrous. The species is allied to *V. flaccidissima* Maxim. of Japan.

DIPSACACEAE (by Takasi Yamazaki)

Dipsacus atratus Hooker f. et Thoms. ex C. B. Clarke in Hooker f., Fl. Brit. Ind. **3**: 218 (1881).

Ramam, 1900–2400 m (May 7, 1960).

Distr. E. Himalaya (Sikkim), and Darjeeling.

Dipsacus mitis D. Don, Prodr. Fl. Nepal. 161 (1825)–Hand.-Mzt., Symb. Sin. **7**: 1058 (1936).

Dipsacus inermis Wall. var. *β*. Wall. in Roxb., Fl. Ind. ed. Carey, **1**: 367 (1820)–Fl. Brit. Ind. **3**: 217 (1881).

Murhay-Bilbatay Bhanjang, 2100m (Oct. 24, 1963); Taplejung-Garhi Danra, 1900-2200m (Nov. 3, 1963); Dumhan-Taplejung (Nov. 1, 1963); Taplethok-Helok, 1400-1500m (Nov. 6, 1963); Baroya Khimty-Thakma Khola, 2500-2400m (Nov. 12, 1963, fl. greenish white); Helok-Iladanda (Nov. 8, 1963).

Distr. Himalaya (Kashmir to Bhutan), and W. China (Yunnan).

Morina betonicoides Bentham in Hooker, Icon. Pl. t. 1171 (1873)–Fl. Brit. Ind. **3**: 217 (1881).

Jongri, 4200 m (May 22, 1960); Jongri-Gamothang, 3900–4000 m (May 26, 1960); Phalut, 3500 m (Jun. 4, 1960, fl.).

Distr. E. Himalaya (Nepal, Sikkim), and S. Tibet.

Triplostegia glandulifera Wallich ex Bentham in DC., Prodr. **4**: 642 (1830)–Fl. Brit. Ind. **3**: 215 (1881).

Bilbatay Bhanjang-Hati Sar, 2400-2900m (Oct. 27, 1963); Hati Sar-Minchin Dhap (Oct. 28, 1963); Minchin Dhap-Mul Pokhari, 2900-2500m (Oct. 29, 1963).

Distr. Himalaya (Garhwal to Bhutan), W. & C. China (Szechuan, Hupeh), and Formosa.

CUCURBITACEAE (by Masami Mizushima)

Biswarea tonglensis (C. B. Clarke) Cogniaux in Bull. Soc. Bot. Belg. **21**: 16 (1882); in Pfl.-reich IV–275. II, Ht. **88**: 175 (1924)–Chakravarty in Rec. Bot. Surv. Ind. **17**: 65 (1959).

Warea tonglensis C. B. Clarke in Journ. Linn. Soc. **15**: 129, f. 1–8 (1876); in Fl. Brit. Ind. **2**: 612 (1879).

Garibans–Tonglu, 2800 m (Jun. 7, 1960, fl.); Senchal–Tiger Hill, 2400–2500 m (Jun. 23, 1960, fl.); Senchal, 2350 m (Sep. 19, 1964, fl.).

Distr. E. Himalaya.

Bryonopsis laciniosa (L.) Naudin in Ann. Sci. Nat. 4 sér. **12**: 141 (1859)–Cogniaux et Harms in Pfl.-reich IV–275. II, Ht. **88**: 160, f. 16 (1924)–Chakravarty, l.c. 135 (1959).

Bryonia laciniosa L., Sp. Pl. ed. 1, 1013 (1753)–Fl. Brit. Ind. **2**: 622 (1879).

Rayang, 250 m (Apr. 21, 1960, no. 1849, fr.); Kalimpong, 1300 m (Apr. 23, 1960, fr.); Kathmandu–Thankot, 1400–1300 m (Sep. 19, 1963, fr.); Sunderijal, Kathmandu, 1500 m (Sep. 20, 1963, fr.); Kathmandu, 1400 m (Oct. 13, 1963, fr. & fl.); Biratnagar, 200 m (Oct. 14, 1963, fl. & fr.); Dhara Pani–Dhankuta, 900–1200 m (Oct. 17, 1963, fl. & fr.); Tharpu–near Chyangthaphu, 1200–1100 m (Nov. 26, 1963, fr.); Illam, 1200 m (Dec. 6, 1963, fr.).

Distr. Africa, Australia, throughout India, Burma, Ceylon, Malaysia, Indo-China, S. China, Formosa, and Ryukyu.

Plants with orange-red fruits, var. *erythrocarpa* (F. Muell.) Naud., are found mixed with the typical form with yellowish green fruits. Therefore they should be called *B. laciniosa* Naud. f. **erythrocarpa** (F. Muell.) Mizushima in Journ. Jap. Bot. **41**: 259 (1966) (=*Zehneria erythrocarpa* F. Muell. in Hook., Kew Journ. Bot. **8**: 51, 1856; *B. laciniosa* var. *erythrocarpa* (F. Muell.) Naud.).

Coccinia cordifolia (L.) Cogniaux in DC., Monogr. Phan. **3**: 529 (1881)–Chakravarty, l.c. 117 (1959).

Coccinia indica Wight et Arnott, Prodr. Fl. Pen. Ind. Orient. 347 (1834).

Cephalandra indica (W. et A.) Naudin in Ann. Sci. Nat. 5 sér. **5**: 16 (1866)–Fl. Brit. Ind. **2**: 621 (1879), excl. syn. nonnul.

Biratnagar, 200 m (Oct. 14, 1963, fl. & fr.).

Distr. Africa, India, Ceylon, Malaya, and S. China (Kwangtung, Hainan).

Cucumis sativus L., Sp. Pl. ed. 1, 1012 (1753)–Fl. Brit. Ind. **2**: 620 (1879)–Cogn. et Harms, l.c. 143 (1924)–Chakravarty, l.c. 105 (1959).

Tuwa–Taplethok, 1800–1300 m (Nov. 5, 1963, fl.).

Distr. Cultivated throughout India, and also in warmer regions of the world; Indian origin?

Cyclanthera pedata Schrader, Ind. Sem. Hort. Gotting. (1831)–Cogn. in DC., Monogr. Phan. **3**: 825 (1881)–Chakravarty, l.c. 178 (1959).

Kathmandu–Thankot, 1300 m (Sep. 20, 1963, fl.); Phusri–Dhara Pani, 600–1100 m (Oct. 16, 1963, fl. & fr.); Dhankuta, 1200 m (Oct. 20, 1963, fl. & fr.).

Distr. Cultivated for vegetable or ornament; native of C. and S. America.

Edgaria darjeelingensis C. B. Clarke in Journ. Linn. Soc. **15**: 113 (1876); in Fl. Brit. Ind. **2**: 632 (1879)–Cogn., l.c. I, Ht. **66**: 177, f. 41 (1916)–Chakravarty, l.c. 130 (1959).

Darjeeling, 2000 m (Jun. 26, 1960, fl.).

Distr. Himalaya (Garhwal to Sikkim).

Gomphogyne cissiformis Griffith, Pl. Cator. 26, in adnot., t. 4 (1837)–Fl. Brit. Ind. **2**: 632 (1879)–Cogn., l.c. 38, f. 12 (1916)–Chakravarty, l.c. 184 (1959).

Sinduwa, 2100 m (Oct. 23, 1963, male fl.; Oct. 24, 1963, female fl. & fr.); Murhay-

Bilbatay Bhanjang, 2000–2200 m (Oct. 24, 1963, female fl. & fr.) ; Taplethok–Helok, 1500 m (Nov. 6, 1963, fr.) ; Mai Pokhari–Dhara Pani, 1700–1500 m (Dec. 4, 1963, fr.).

Distr. Himalaya (Garhwal to Sikkim), Malaya, Indo-China, SW. China, and Philippines.

Plants with glabrous or villose fruits are found within the same locality, and both forms do not merit a varietal segregation. Therefore, the form with villose fruits should be called *G. cissiformis* Griff. f. **villosa** (Cogn.) Mizushima in Journ. Jap. Bot. **41**: 259 (1966) (=*G. cissiformis* var. *villosa* Cogn. in DC., Monogr. Phan. **3**: 925, 1881).

Gynostemma pentaphyllum (Thunb.) Makino in Bot. Mag. Tokyo **16**: 179 (1902)–Hara, Enum. Sperm. Jap. **2**: 80 (1952).

Vitis pentaphylla Thunberg, Fl. Jap. 105 (1784).

Gynostemma pedata Blume, Bijdr. 23 (1825)–Fl. Brit. Ind. **2**: 633 (1879)–Chakravarty, l.c. 188 (1959).

Darjeeling, 2200 m (Apr. 10, 1960, fr.; Dec. 26, 1963, anom. fr.); Bilbatay Bhanjang, 2200 m (Oct. 26, 1963, fl. & fr.); Minchin Dhap–Mul Pokhari, 2800–2400 m (Oct. 29, 1963, fl.); Dumhan–Taplejung, 700–2000 m (Nov. 1, 1963, fr.); Garhi Danra–Tuwa, 2200–1600 m (Nov. 4, 1963, fr.); Bhuspate Danra, 2600 m (Dec. 2, 1963).

Distr. India, Ceylon, Burma, east to China, Japan, and Malaysia.

Herpetospermum pedunculosum (Sér.) Baillon, Hist. Pl. **8**: 445 (1886)–Cogn. et. Harms, l.c. 176 (1924)–Chakravarty, l.c. 69 (1959), nom. auct. sphalmate "Clarke."

Rampinia herpetospermoides C. B. Clarke in Journ. Linn. Soc. **15**: 130, f. 9–15 (1876).

Herpetospermum caudigerum Wallich ex C. B. Clarke in Fl. Brit. Ind. **2**: 613 (1879)–Cogn. in DC., Monogr. Phan. **3**: 404 (1881).

Dhankuta–Sinduwa, 1200–2000 m (Oct. 22, 1963, male fl.); Murhay–Sinduwa, 2100 m (Oct. 24, 1963, male & female fl., fr.); Yektin–Batasay, 1400–2400 m (Nov. 30, 1963, fr.).

Distr. Himalaya (Kulu to Bhutan), Assam, and SW. China.

Hodgsonia macrocarpa (Bl.) Cogniaux in DC., Monogr. Phan. **3**: 349 (1881)– Chakravarty, l.c. 27 (1959).

H. heteroclita Hook. f. et Thoms. in Proc. Linn. Soc. **2**: 257 (1853)–Fl. Brit. Ind. **2**: 606 (1879).

Tista–Kalimpong, 700 m (Jun. 19, 1960, fr.); Pamianchi–Tingling Bridge, 2000–1000 m (May 15, 1960).

Distr. E. Himalaya (Sikkim), Assam, Burma, Malaysia, and SW. China.

Lagenaria siceraria (Molina) Standley in Publ. Field Mus. Bot. ser. 3, no. 279, 435 (1930)–Hara, Enum. Sperm. Jap. **2**: 80 (1952).

Cucurbita siceraria Molina, Sagg. Storia Nat. Chile 133 (1782).

Lagenaria vulgaris Séringe in Mém. Soc. Phys. Hist. Nat. Genève **3** (1): 25, t. 2 (1825)–Fl. Brit. Ind. **2**: 613 (1879)–Cogn. et Harms, l.c. 201, f. 24-A-C (1924).

L. leucantha (Duc.) Rusby in Mem. Torrey Bot. Cl. **6**: 43 (1896)–Nakai in Journ. Jap. Bot. **18**: 22 (1942)–Chakravarty, l.c. 66 (1959).

Biratnagar, 200 m (Oct. 14, 1963, fl.).

Distr. Cultivated throughout India, and also in warmer regions of the world;

said to be African or tropical Asiatic origin.

Melothria heterophylla (Lour.) Cogniaux in DC., Monogr. Phan. **3**: 618 (1881); l.c. 121, f. 28 (1916), cum form. 1–12–Nakai in Journ. Jap. Bot. **14**: 125, f. 1-C (1938)–Chakravarty, l.c. 159 (1959), cum form.

Zehneria umbellata (Klein) Thwaites, Enum. Pl. Zeyl. 125 (1859–64)–Fl. Brit. Ind. **2**: 625 (1879), excl. syn. nonnul.

Pamianchi–Tingling Bridge, 2000–1000 m (May 15, 1960, female fl.-bud); Ratong Chu–Yoksam, 1500 m (May 16, 1960); Godavari, Kathmandu, 1500 m (Sep. 18, 1963, female fl.); Dhara Pani–Dhankuta, 900–1200 m (Oct. 17, 1963, old male infl.); Nissim–Dumhan, 1000 m (Oct. 30, 1963, old male infl.); Garhi Danra–Tuwa, 2200–1800 m (Nov. 4, 1963); below Siling Tzokupa–Siling Tzokupa, 2100–3800 m (Nov. 21, 1963, fr.); Kathgara–Rangali, 200 m (Dec. 14, 1963, old male infl.).

Distr. Afghanistan, India, Ceylon, Burma, Indo-China, SW. China, Formosa, and Malaysia.

Melothria indica Loureiro, Fl. Cochinch. 35 (1790)–Fl. Brit. Ind. **2**: 626 (1879), excl. syn. *M. Regelii* Naud.-Cogn., l.c. 98 (1916)–Chakravarty, l.c. 150 (1959).

Khebang–Bharomdin, 1700–1000 m (Nov. 24, 1963, fr.); Ranga Pani–Ghorwa, 700–300 m (Dec. 9, 1963, fr.).

Distr. Himalaya (Garhwal to Sikkim), Burma, eastward to C. China, Philippines, and Melanesia.

Melothria maderaspatana (L.) Cogniaux in DC., Monogr. Phan. **3**: 623 (1881); l.c. 126, f. 29 (1916)–Nakai in Journ. Jap. Bot. **14**: 126, f. 1-D (1938)–Chakravarty, l.c. 141 (1959).

Mukia scabrella (L. f.) Arnott in Hook., Journ. Bot. **3**: 276 (1841)–Fl. Brit. Ind. **2**: 623 (1879), excl. syn. *Keriviam javanicam* Miq.

Melothria althaeoides (Sér.) Nakai, l.c. 127, f. 1-E (1938).

Biratnagar, 200 m (Oct. 14, 1963, fr.); Dhankuta, 1200 m (Oct. 19, 1963, fl. & fr.); Ranga Pani–Ghorwa, 700–300 m (Dec. 9, 1963, fr.); Sanichare–Sibganja, 200 m (Dec. 11, 1963, fr.); Sibganja–Mahara Bahara, 200 m (Dec. 12, 1963, fr.).

Distr. India, east through Indo-China to SW. China and Formosa; south through Malaysia to Australia and New Zealand; Africa.

Melothria perpusilla (Bl.) Cogniaux in DC., Monogr. Phan. **3**: 607 (1881); l.c. 106 (1916)–Chakravarty, l.c. 146 (1959).

Zehneria Hookeriana (Wight et Arn.) Arnott in Hook., Journ. Bot. **3**: 275 (1841)–Fl. Brit. Ind. **2**: 624 (1879), excl. syn. *Z. exasperatam* Miq.

Melothria mucronata Cogn. sensu Nakai in Journ. Jap. Bot. **14**: 130 (1938), p.p.

Garhi Danra–Tuwa, 2200–1800 m (Nov. 4, 1963, fl.); Tuwa–Taplethok, 1800–1300 m (Nov. 5, 1963, fl. & fr.).

Distr. India, Burma, Indo-China, SW. China, Formosa, Japan (S. Kyushu), and Malaysia.

Momordica Charantia L., Sp. Pl. ed. 1, 1009 (1753)–Fl. Brit. Ind. **2**: 616 (1879)–Cogn. et Harms, l.c. 24, f. 3-A-C (1924)–Chakravarty, l.c. 88 (1959).

Mul Pokhari–Gorzu Kosir, 2100 m (Oct. 30, 1963, fr.); Khebang, 1400 m (Nov. 23, 1963, fl. & fr.); Dhara Pani–Illam, 1500–1200 m (Dec. 5, 1963, fr. only).

Distr. Cultivated and wild throughout India, also cultivated and escaped widely in the Old and New World tropics; probably native of tropical Asia.

Sechium edule (Jacq.) Swartz, Fl. Ind. Occ. **2**: 1150 (1800)–Makino in Journ. Jap. Bot. **3**: (36)–(40) cum fig. (1926)–Chakravarty, l.c. 204 (1959).

Dhankuta, 1200 m, cult. (Oct. 19, 1963, fl. & fr.); below Siling Tzokupa–Khebang, cult., 2100–1700 m (Nov. 22, 1963, fr.).

Distr. Becoming widely cultivated in India, also widely cultivated in the Old and New World tropics; native of tropical America (W. Indian?).

Thladiantha calcarata Cogniaux in DC., Monogr. Phan. **3**: 423 (1881), cum descr. lat.; l.c. 50 (1916).

Momordica calcarata Wallich, Cat. no. 6740 (1828), nom. nud.

Thladiantha calcarata (Wall.) C. B. Clarke in Journ. Linn. Soc. **15**: 126(1876), comb. nud. et sine descr.–Chakravarty, l.c. 125 (1959).

T. dubia Bunge sensu Hook. f. in Bot. Mag. t. 5469 (1864), excl. fl. masc.–Fl. Brit. Ind. **2**: 631 (1879).

Palmajua–Rimbick, 2300–1400 m (May 5, 1960); Pamianchi, 2000 m (May 13, 1960, male fl.); Yoksam, 1700 m (May 17, 1960, male fl.); Gangtok, 1600 m (Jun. 15, 1960, female fl.); Bilbatay Bhanjang, 2200 m (Oct. 26, 1963); Taplethok–Helok, 1300–1500 m (Nov. 6, 1963, fr.); Iladanda–Selap, 1800–2600 m (Nov. 9, 1963, fr.).

Distr. E. Himalaya, Assam, Burma, Indo-China, and SW. China.

The calyx-lobes are described to be linear, 8–10 mm long, 1–1.5 mm wide, but those in our specimens are measured to be from 1.5 to 2.5 mm broad.

Trichosanthes cucumerina L., Sp. Pl. ed. 1, 1008 (1753)–Fl. Brit. Ind. **2**: 609 (1879)–Kundu in Journ. Bomb. Nat. Hist. Soc. **43**: 372 (1942)–Chakravarty, l.c. 31 (1959).

T. pachyrrhachis Kundu in Journ. Bot. **77**: 9 (1939); in Journ. Bomb. Nat. Hist. Soc. **43**: 372, pl. 1 (1942).

T. brevibracteata Kundu, l.c. 10 (1939); l.c. 373, pl. 2 (1942).

Dhara Pani–Illam, 1500–1200 m (Dec. 5, 1963, fr.)–this specimen is only of pericarp, therefore the identification is rather questionable; Dharan, 200 m (Dec. 15, 1963, monoecious, male fl. & fr.).

Distr. India, Ceylon, Burma, Java, and N. Australia.

Trichosanthes himalensis C. B. Clarke in Fl. Brit. Ind. **2**: 608 (1879)–Kundu in Journ. Bomb. Nat. Hist. Soc. **43**: 382 (1942)–Chakravarty, l.c. 50 (1959).

var. **sikkimensis** (Kundu) Thothathri in Bull. Bot. Surv. Ind. **2**: 169 (1960).

T. ovigera Bl. var. *sikkimensis* Kundu, l.c. 383 (1942).

T. himalensis Cl. var. *indivisa* Chakravarty, l.c. 51 (1959).

Ghatte–Khebang, 1600–1700 m (Nov. 19, 1963).

Distr. N. India, and S. China (Kwangtung).

Trichosanthes Lepiniana (Naud.) Cogniaux in DC., Monogr. Phan. **3**: 377 (1881)–Kundu in Journ. Bomb. Nat. Hist. Soc. **43**: 380 (1942)–Chakravarty, l.c. 48 (1959).

Yoksam, 1700 m (May 17, 1960, male fl.).

Distr. E. Himalaya, Assam, India, and Indo-China.

Trichosanthes Wallichiana (Sér.) Wight in Ann. & Mag. Nat. Hist. **8**: 270 (1842)–Kundu in Journ. Bomb. Nat. Hist. Soc. **43**: 377 (1942)–Chakravarty, l.c. 41 (1959).

T. multiloba Miq. sensu C. B. Clarke in Fl. Brit. Ind. **2**: 607 (1879).

Dentam, 1500 m (May 11, 1960, young male infl.); Dumhan–Taplejung, 1200 m (Nov. 1, 1963, fr.); Tharpu–near Chyangthaphu, 1200–1100 m (Nov. 26, 1963, fr.).

Distr. Himalaya (Simla to Sikkim), Assam, Burma, Indo-China, and Malaya.

CAMPANULACEAE (by Hiroshi Hara)

Campanula colorata Wallich in Roxburgh, Fl. Ind. ed. Carey, **2**: 101 (1824)–Fl. Brit. Ind. **3**: 440 (1881).

Kathmandu, 1500 m (Sep. 17 & Oct. 13, 1963, fr.); Kakani, 2000 m (Sep. 24, 1963, fl.); Murhay, 2100 m (Oct. 22, 1963, fl.); Hilay, above Dhankuta, 1700 m (Oct. 23, 1963, fl.); Chitray–Sinduwa, 2100–2200 m (Oct. 24, 1963, fl.); Bilbatay Bhanjang, 2200 m (Oct. 26, 1963, fl.); Baroya Khimty, 2500 m (Nov. 10 & 11, 1963, fl.); Yektin–Akasay, 1500–2200 m (Nov. 30, 1963, fl.); Batasay–Bhuspate Danra, 2200–2700 m (Dec. 1, 1963, fl.); Darjeeling, 2200 m (Dec. 26, 1963, fr.; Sep. 15, 1964).

Distr. Afghanistan, Himalaya, Khasia, S. Tibet, Indo-China, and W. China.

Codonopsis affinis Hook. f. et Thoms. in Journ. Linn. Soc. **2**: 12 (1857)–Fl. Brit. Ind. **3**: 431 (1881)–Chipp in Journ. Linn. Soc. **38**: 389 (1908)–Anthony in Not. Bot. Gard. Edinb. **15**: 180 (1926).

Sinduwa, 2100 m (Oct. 24, 1963, fr.); above Bilbatay Bhanjang, 2700 m (Oct. 26, 1963, fr.); Bilbatay Bhanjang–Hati Sar (Oct. 27, 1963, fr.); Minchin Dhap–Mul Pokhari, 2900–2500m (Oct. 29, 1963, fl. & fr.); Baroya Khimty–Thakma Khola, 2500–2700 m (Nov. 12, 1963, fr.).

Distr. E. Himalaya (Nepal, Sikkim).

Codonopsis inflata Hook. f. et Thoms., Ill. Himal. Pl. t. 16, C (1855); in Journ. Linn. Soc. **2**: 13 (1857).

Campanumaea inflata (Hook. f. et Thoms.) C. B. Clarke in Fl. Brit. Ind. **3**: 436 (1881).

Mai Majuwa–Mai Pokhari, 1900 m (Dec. 4, 1963, fr.).

Distr. E. Himalaya (E. Nepal to Bhutan).

Codonopsis viridis Wallich in Roxburgh, Fl. Ind. ed. Carey, **2**: 103 (1824)–Hook. f. et Thoms. in Journ. Linn. Soc. **2**: 12 (1857)–Fl. Brit. Ind. **3**: 431 (1881)–Chipp, l.c. 386 (1908)–Anthony, l.c. 180 (1926).

Baroya Khimty, 2500 m (Nov. 11, 1963, fr.); Thakma Khola (Nov. 12 & 16, 1963, fl. & fr.); Ghatte–Khebang, 1600–2400m (Nov. 19, 1963, fl. & fr.); Kaulepati Bhanjang–Khunga, 1700 m (Nov. 27, 1963, fr.); Birwa–Yektin (Nov. 28, 1963, fr.); Yektin–Akasay, 1400–2400 m (Nov. 30, 1963).

Distr. Himalaya (Garhwal to Nepal), and Khasia.

Cyananthus inflatus Hook. f. et Thomson in Journ. Linn. Soc. **2**: 21 (1857)–Fl. Brit. Ind. **3**: 435 (1881)–Franchet in Journ. de Bot. **1**: 281 (1887), var. *tenuis* Franch.–Marquand in Kew Bull. **1924**: 249, f. 5. (1924).

Tinjuray, 3000 m (Oct. 27, 1963, fl.); Selap–Walunchung Gola, 2600–3800 m (Nov. 10, 1963, fr.); Diorali Bhanjang, 3700 m (Nov. 14, 1963, fr.).

Distr. sp. E. Himalaya (E. Nepal to Bhutan), Assam, S. Tibet, and W. China (Yunnan, Szechuan).

Cyananthus lobatus Bentham ex Royle, Ill. Bot. Himal. 309, t. 69, f. 1 (1836)–Fl. Brit. Ind. **3**: 433 (1881)–Franchet, l.c. 259 (1887)–Marquand, l.c. 246, f. 1–2 (1924), var. *lobatus*.

Jongri, 4100 m (May 24, 1960, fr.).

Distr. Himalaya (Punjab to Sikkim), S. Tibet, and W. China.

Leptocodon gracilis (Hook. f. et Thoms.) Lemaire in Ill. Hort. **3**: Misc. 49 (1856)–Hook. f. et Thoms. in Journ. Linn. Soc. **2**: 17 (1857); Fl. Brit. Ind. **3**: 430 (1881).

Codonopsis gracilis Hook. f. et Thoms., Ill. Himal. Pl. t. 16, A (1855).

Sinduwa–Chitray, 2200m (Oct. 24, 1963, fl., fr.); Lagyap, 2200m (Sep. 13, 1964, fl.).

Distr. E. Himalaya (E. Nepal to NEFA), and W. China (Yunnan, Szechuan).

Lobelia alsinoides Lamarck, Encycl. Méth. **3**: 588 (1791–92)–Wimmer in Pfl.-reich IV–276 b, Ht. **107**: 571, f. 93 g (1953).

L. trigona Roxburgh, Fl. Ind. ed. Carey, **2**: 111 (1824)–Fl. Brit. Ind. **3**: 423 (1881).

Dumhan, 700–1000 m (Oct. 30 & 31, 1963, fl. & fr.); Bharomdin–Tharpu, 700–1200 m (Nov. 25, 1963, fl. & fr.); Sibganja–Mahara Bahara, 200 m (Dec. 12, 1963, fr.);

Distr. India, Ceylon, Burma, Indo-China, Malaysia, and W. China.

L. Hancei Hara[1] is distinguished from *L. alsinoides* by elongate narrower leaves with obscure serration, and inconspicuous bracteoles.

Lobelia chinensis Loureiro, Fl. Cochinch. **2**: 514 (1790)–Hara, Enum. Sperm. Jap. **2**: 98 (1952)–Wimmer, l.c. 609 (1953).

L. radicans Thunb. in Trans. Linn. Soc. **2**: 330 (1794)–Fl. Brit. Ind. **3**: 425 (1881).

Kathmandu–Thankot, 1500 m (Sep. 19, 1963, fl.).

Distr. E. Himalaya (Nepal), Khasia, Thai, Indo-China, Malaysia, China, Formosa, Korea, and Japan.

Lobelia erectiuscula Hara in Journ. Jap. Bot. **40**: 328 (1965).

L. erecta (non de Vriese 1845) Hook. f. et Thoms. in Journ. Linn. Soc. **2**: 28 (1857)–Fl. Brit. Ind. **3**: 426 (1881)–Wimmer, l.c. 656, f. 99 j (1953).

Sandakphu–Gatribas, 3000–2800 m (Sep. 17, 1964, fl. blue-violet & fr.).

Distr. E. Himalaya (Nepal, Sikkim), S. Tibet, and W. & C. China.

Lobelia Heyneana Roem. et Schultes, Syst. Veg. **5**: 50 (1819), ut *Heyniana*–Wimmer, l.c. 473 (1953).

L. trialata Hamilt. ex D. Don, Prodr. Fl. Nepal. 157 (1825)–Fl. Brit. Ind. **3**: 425 (1881).

Pouwa, Kathmandu, 1600 m (Oct. 9, 1963, fl.); Dumhan–Taplejung, 700–1900 m (Oct. 31, 1963, fl.); Helok, 1500 m (Nov. 7, 1963, fl. & fr.); Illam, 1200 m (Dec. 7, 1963, fl. & fr.).

Distr. E. Africa, India, Ceylon, Thai, Indo-China, Malaysia, and W. China.

Lobelia pyramidalis Wallich in Asiat. Research. **13**: 376 (1820)–Fl. Brit. Ind. **3**: 426 (1881), p.p.–Skottsberg in Act. Hort. Gothob. **4**: 21, f. 25–31 (1928)–Wimmer, l.c. 646, f. 99 f (1953).

Birch Hill, Darjeeling, 2100 m (Apr. 5 & 8, 1960, fl.white); Kurseong, 1600m (Apr.

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1) **Lobelia Hancei** Hara in Journ. Jap. Bot. **17**: 23 (1941); Enum. Sperm. Jap. **2**: 99 (1952).

L. chinensis var. *cantonensis* Wimmer in Fl. Gén. Ind.-Chin. **3**: 681 (1930).

L. alsinoides var. *cantonensis* Wimmer in Ann. Nat. Mus. Wien **56**: 360 (1948); l.c. 573 (1953).

Distr. Indo-China, Malaysia, S. China, Formosa, and S. Japan.

12, 1960, no. 785, fl.); Namchi–Damthang, 2000 m (Mar. 27, 1963, fl.).

Distr. E. Himalaya (Nepal to NEFA), Khasia, Manipur, Naga Hills, N. Burma, and Indo-China.

Lobelia Seguinii Léveillé et Vaniot in Fedde, Rep. **12**: 186 (1913)–Wimmer, l.c. 648, f. 99 a (1953).

var. **Doniana** (Skottsb.) Wimmer, l.c. 651, f. 99 b (1953).

L. Doniana Skottsberg in Act. Hort. Gothob. **4**: 19, f. 19–24 (1928).

Kakani, 2100–2200 m (Sep. 24, 1963, fl.); Bilbatay Bhanjang, 2200 m (Oct. 25, 1963, fl. & fr.); Sinduwa, 2100m (Oct. 23 & 24, 1963, fr.); Mul Pokhari, 2500m (Oct. 29, 1963, fl. violet, fr.); Helok–Iladanda, 1500–1800 m (Nov. 8, 1963, fr.); Baroya Khimty, 2500 m (Nov. 11, 1963, fr.); Thakma Khola, 3200 m (Nov. 14, 1963, fr.); Halhale Bhanjang, 2700 m (Dec. 1, 1963, fr.).

Distr. Himalaya (Garhwal to Sikkim), Khasia, Manipur, Naga Hills, and W. China (Yunnan).

L. pyramidalis, *L. Seguinii*, and *L. erectiuscula* are distinct species, and I cannot agree with Moeliono and Tuyn (Fl. Males. **6**: 123, 1960) to lump them in *L. nicotianaefolia* Roth ex Roem. et Schult.

Lobelia zeylanica L., Sp. Pl. ed. 1, **2**: 932 (1753)–Merrill et Perry in Journ. Arn. Arb. **22**: 386 (1941)–Fl. Males. **6**: 128 (1960).

L. succulenta Blume, Bijdr. 728 (1826)–Wimmer, l.c. 576 (1953).

L. affinis Wallich ex G. Don, Gen. Hist. **3**: 709 (1834)–Fl. Brit. Ind. **3**: 424 (1881).

Illam–Ranga Pani, 1200–400 m (Dec. 8, 1963, fr.); Ghorwa–Sanichare, 300–200 m (Dec. 10, 1963, fr.).

Distr. India, Ceylon, Thai, Indo-China, Malaysia, Fiji, China, and Formosa.

Peracarpa carnosa (Wall.) Hook. f. et Thomson in Journ. Linn. Soc. **2**: 26 (1857)–Fl. Brit. Ind. **3**: 437 (1881)–Hara in Journ. Jap. Bot. **21**: 19 (1947).

Campanula carnosa Wallich in Roxburgh, Fl. Ind. ed. Carey, **2**: 102 (1824).

Mani Bhanjang–Batasi, 2000–2100m (May 1, 1960, no. 12, fl.); Kurseong, 1550m (Apr. 12, 1960, no. 794, fl.); Batasi–Palmajua, 2100–2300 m (May 3, 1960, no. 61, fl.); Senchal, 2300 m (Apr. 6 & 16, 1960, fl.); Bakkim–Jongri, 2400–2500 m (May 19, 1960, fl.); Tendong Peak, 2700 m (Mar. 26, 1963, fl.); Sinduwa, 2100m (Oct. 24, 1963, fr.); Baroya Khimty, 2500 m (Nov. 11, 1963, fr.).

Distr. Himalaya (Garhwal to Bhutan), Khasia, Manipur, N. Burma, N. Thai, and W. China.

As regards the relation to the Japanese plants, see page 653.

Pratia montana (Reinw.) Hasskarl in Flora **25**, Beibl. 1: 23 (1842)–Fl. Brit. Ind. **3**: 423 (1881)–Wimmer in Pfl.-reich IV–276 b, Ht. **106**: 116 (1943).

Lobelia montana Reinwardt ex Blume, Bijdr. 728 (1826)–Fl. Males. **6**: 132, f. 17 (1960).

Senchal, 2300 m (Dec. 27, 1963, fr.).

Distr. E. Himalaya (Nepal, Sikkim), N. Assam, Deccan, Manipur, N. Indo-China, S. W. China (Yunnan), and Malaysia (Malay to Java).

Pratia nummularia (Lam.) A. Br. et Ascherson, Ind. Sem. Hort. Berol. 1861, app. 6 (1861)–Wimmer, l.c. 112 (1943).

Lobelia nummularia Lamarck, Encycl. Méth. **3**: 589 (1791–92).

L. begonifolia Wallich in Asiat. Research. **13**: 377 (1820).

Pratia begonifolia (Wall.) Lindley in Bot. Reg. t. 1373 (1830)–Fl. Brit. Ind. **3**: 442 (1881).

Takdah, 1600 m (Apr. 18, 1960, fl.); Kalimpong, 1300 m (Apr. 23, 1960, fl.); Mani Bhanjang–Batasi, 1700m (May 1, 1960, no. 7, fl.); Yoksam, 1700m (May 18, 1960, fl.); Gangtok, 1600 m (Jun. 15, 1960, fl.); Penlong La, 2100 m (Jun. 16, 1960, fr.); Kathmandu, 1500 m (Oct. 13, 1960, fr.); Dhankuta–Hilay, 1500–1700m (Oct. 23, 1963, fl. & fr.); Sinduwa, 2100m (Oct. 23, 1963, fr.); Chitray, 2200m (Oct. 24, 1963, fr.); Nissim–Dumhan, 1200 m (Oct. 30, 1963, fr.); Taplejung, 1700 m (Nov. 2, 1963, fr.); Khebang–Siling Tzokupa (Nov. 20, 1963, fr.); Dhara Pani–Illam, 1200–1500 m (Dec. 5, 1963, fr.).

Distr. Himalaya, Burma, Thai, Indo-China, W. & S. China, Formosa, and Malaysia.

Moeliono & Tuyn (1960) has united this plant with *Lobelia angulata* Forst. (1786).

SPHENOCLEACEAE (by Hiroshi Hara)

Sphenoclea zeylanica Gaertner, Fruct. et Sem. **1**: 113, t. 24, f. 5 (1788)–Fl. Brit. Ind. **3**: 438 (1881)–Airy Shaw in Fl. Males. **4**: 27 (1948).

Biratnagar (Oct. 14, 1963, fl. fr.); Kathgara–Rangali, 200 m (Dec. 14, 1963, fr.).

Distr. Tropical Africa, C. Asia, India east to China and Formosa, and south to Malaysia.

COMPOSITAE (by Siro Kitamura)

Acanthospermum hispidum DC., Prodr. **5**: 522 (1836).

Phusri–Dhara Pani, 450–900 m (Oct. 16, 1963); Khebang–Bharomdin, 1700–1000 m (Nov. 24, 1963).

Distr. An introduced weed; native of Brazil.

Adenostemma Lavenia (L.) O. Kuntze, Rev. Gen. Pl. **1**: 304 (1891).

Verbesina Lavenia L., Sp. Pl. ed. 1, 902 (1753).

Adenostemma aquaticum et *A. latifolia* D. Don, Prodr. Fl. Nepal. 181 (1825).

Ageratum strictum Sims in Bot. Mag. t. 2410 (1828).

Adenost. viscosum Forst. var. *latifolia* Hooker f., Fl. Brit. Ind. **3**: 242 (1881).

Sanguri Bhanjang–Dhara Pani, 450–900 m (Oct. 16, 1963); Dumhan–Taplejung, 700–2000 m (Nov. 1, 1963); Kathgara–Rangali, 200 m (Dec. 14, 1963).

The leaves are ovate and cuneate at the base, but the upper leaves are sometimes truncate or subcordate at the base. Heads 10 mm. in diam. in fruiting time. Achenes 3 mm long, densely warted or glangular punctate. The type locality of var. *Lavenia* is Ceylon. The figure of the type is given in Burm., Thes. Zeyl. t. 42.

In India *A. Lavenia* is very variable and has varieties. In Japan, *A. Lavenia* is not variable and represented only by var. *Lavenia*.

var. **elata** (D. Don) Kitamura, comb. nov.

Adenost. elatum D. Don, Prodr. Fl. Nepal. 181 (1825).

A. Roylei DC., Prodr. **5**: 112 (1836).

A. viscosum β. viscosum verum C. B. Clarke, Compos. Ind. 29 (1876).

A. viscosum var. *typica* Hooker f., l.c. 242 (1881).

A. viscosum var *elata* (D. Don) Hooker f., l.c. 242 (1881), excl. descr. et syn. p.p.

Ghorwa-Sanichare, 300-200 m (Dec. 10, 1963).

Distr. sp. Pantropic.

The leaves are oblong or oblong-lanceolate, and attenuate at the base. Heads 10 mm in diameter in fruiting time. Achenes 3–3.5 mm long warted.

Ageratum conyzoides L., Sp. Pl. ed. 1, 839 (1753).

Gangtok, 1600 m (Jun. 13 & 16, 1960); Kathmandu Airport, 1400 m (Oct. 13, 1963); Biratnagar, 200 m (Oct. 14, 1963); Phusri–Dhara Pani, 450–900 m (Oct. 16, 1963); Taplethok–Helok, 1300–1500 m (Nov. 6, 1963); below Siling Tzokupa–Khebang, 2100–1700 m (Nov. 22, 1963); Tharpu, 1200 m (Nov. 26, 1963); Mai Majuwa–Dhara Pani, 1600–1500 m (Dec. 4, 1963).

Distr. Pantropic.

Ageratum Houstonianum Miller, Gard. Dict. ed. 8 (1768).

Gangtok, 1600 m (Apr. 26 & Jun. 16, 1960).

Distr. Pantropic. A native of Mexico.

Ainsliaea aptera DC., Prodr. **7**: 14 (1838).

Yoksam–Bakkim, 2000 m (May 18, 1960); Bilbatay Bhanjang–Tinjuray, 2600 m (Oct. 27, 1963); Hati Sar, 2700 m (Oct. 27, 1963, inflorescence bracteate); Minchin Dhap–Mul Pokhari, 2500 m (Oct. 29, 1963); Iladanda–Selap, 2100 m (Nov. 9, 1963); Helok–Baroya Khimty; 1500–2500 m (Nov. 10 & 15, 1963); below Siling Tzokupa–Siling Tzokupa, 2100–3800 m (Nov. 21, 1963); Birwa–Yektin, 2400–1700 m (Nov. 28, 1963, inflorescence bracteate); Batasay–Bhuspate Danra, 2400–2900 m (Dec. 1, 1963).

Distr. Himalaya (Kashmir to Bhutan).

Ainsliaea latifolia (D. Don) Schulz-Bip. in Pollichia **18–19**: 169 (1861)-Kitamura in Act. Phytotax. Geobot. **19**: 14 (1961).

Liatris latifolia D. Don, Prodr. Fl. Nepal. 169 (1825).

A. pteropoda DC., Prodr. **7**: 14 (1838).

A. reflexa Merrill in Philip. Journ. Sci. Suppl. **3**: 242 (1906).

There are two forms; (1) with leaves persistently white tomentose beneath on the netted veins and (2) with leaves pilose beneath with long slender hairs or glabrous at last.

Form 1.

Birch Hill, Darjeeling, 2000 m (April 5, 1960, fl.); Murhay–Bilbatay Bhanjang, 2000–2200 m (Oct. 24, 1963, before fl.); above Lelep, 2600 m (Nov. 9, 1963, before fl.); Tharpu-near Chyangthaphu, 1200–1100 m (Nov. 26, 1963, before fl.); Yektin–Batasay, 1400–2400 m (Nov. 30, 1963, before fl.); Batasay–Bhuspate Danra, 2400–2900 m (Dec. 1, 1963).

Form 2.

Victoria Fall, Darjeeling, 1900 m (Apr. 3, 1960 fl.); Birch Hill, 2000 m (Apr. 5, 1960); Batasi, 2000 m (May 2, 1960, fr.); Batasi–Palmajua, 2300–2600 m, (May 3, 1960); Palmajua, 2300 m (May 4, 1960); Rimbick–Ramam, 1900–2400 m (May 7, 1960); Yoksam–Preig Chu, 2200 m (May 18, 1960); Bakkim–Jongri, 2500–4000 m (May 19, 1960 fl.); Preig Chu–Jongri, 3600–4000 m (May 19, 1960, pappus very short); Tendong Peak, 2700 m (Mar. 26, 1963); Bilbatay Bhanjang–Hati Sar, 2200–2700 m (Oct. 27, 1963, fr.); Hati Sar–Minchin Dhap, 2700–2800 m (Oct. 28, 1963, fr.); Mul Pokhari–Dumhan, 2400–700 m (Oct. 30, 1963); Baroya Khimty, 2500 m (Nov. 11, 1963, fr.); Zongi–Iladanda, 2600–1800 m (Nov. 12, 1963, fr.); Birwa–Yektin, 2400–1700 m (Nov. 28, 1963).

Distr. Himalaya (Simla to Bhutan), Mishmi Hills, Khasia, Burma, Thai, Indo-China, China, Formosa, and Philippines.

Anaphalis adnata DC., Prodr. **6**: 274 (1838).

Godavari near Kathmandu, 1500 m (Sep. 18, 1963); Pouwa, Kathmandu, 1600 m (Oct. 9, 1963); Dhankuta, 1200 m (Oct. 19, 1963, before fl.); Dhankuta–Murhay, 1200–2000 m (Oct. 23, 1963); Taplejung, 1700 m (Nov. 2, 1963); Taplethok–Helok, 1300–1500 m (Nov. 6, 1963); below Siling Tzokupa–Khebang, 2100–1700 m (Nov. 22, 1963); Mai Majuwa–Dhara Pani, 1600–1500 m (Dec. 4, 1963).

Distr. Himalaya (Simla to Bhutan), Khasia, Burma, Thai, Indo-China, Philippines, China, and Formosa.

Anaphalis Busua (Ham.) Handel-Mazzetti, Symb. Sin. **7**: 1104 (1936).

Gnaphalium Busua Ham.; *A. araneosa* DC.

Dhankuta–Hilay, 1500 m (Oct. 23, 1963); Phusri–Dhara Pani, 450–900 m (Oct. 16, 1963, leaves linear.); Murhay–Bilbatay Bhanjang, 2000–2200 m (Oct. 24, 1963); Bilbatay Bhanjang, 2200 m (Oct. 25, 1963); Bilbatay Bhanjang–Hati Sar, 2200–2700 m (Oct. 27, 1963) ; Helok–Iladanda, 1500–1800 m (Nov. 8, 1963); Ghatte–Khebang, 1600–1700 m (Nov. 19, 1963); Darjeeling (Sep. 16, 1964).

Distr. Himalaya (Mari and Simla to Bhutan), and Khasia.

Anaphalis sinica Hance (*A. pterocaulon* Franch. et Sav.) of China and Japan is closely related to *A. Busua. A. sinica* differs from *A. Busua* by the small broad and obtuse leaves. *A. Busua* has longer, narrower and acuminate leaves.

Anaphalis contorta (D. Don) Hooker f., Fl. Brit. Ind. **3**: 284 (1881).

Antennaria contorta D. Don in Bot. Reg. t. 605 (1821); Prodr. Fl. Nepal. 175 (1825).

Gnaphalium contortum Ham. ex Sprengel, Syst. Veg. **3**: 479 (1826).

Anaphalis Hondae Kitamura in Act. Phytotax. Geobot. **15**: 78 (1953).

Darjeeling, 2100 m (Apr. 2, 1960, after fl.); Kurseong, 1600m (Apr. 12, 1960, after fl.); Jongri, 4200 m (May 23, 1960, after fl.); Jongri–Gamothang 4200–3600m (May 26, 1960, after fl.); Migothang, 3900 m (May 31, 1960, after fl.); Nayathang–Phalut (Jun. 2, 1960, before fl.); Kakani Hill, northwest of Kathmandu, 2100 m (Sep. 24, 1963); Pouwa, Kathamandu, 1600 m (Oct. 9, 1963); Phusri–Dhara Pani, 450–900 m (Oct. 16, 1963, before fl.); Dhankuta–Sinduwa, 1200–2100 m (Oct. 23, 1963); Bilbatay Bhanjang–Hati Sar, 2200–2700 m (Oct. 27, 1963); Selap–Walunchung Gola, 2600–3500 m (Nov. 10, 1963); Tharpu–near Chyangthaphu, 1200–1100 m (Nov. 26, 1963); Batasay–Bhuspte Danra, 2400–2900 m (Dec. 1, 1963); Mai Majuwa–Dhara Pani, 1600–1500 m (Dec. 4, 1963).

Distr. sp. Afghanistan, Karakoram, Pamir, Himalaya, Mishmi Hills, Khasia, and China.

This species is characterized by its small crowded heads.

Var. *roseo-alba* (Krasch.) Kitamura is found in Afghanistan, Pamir and Karakoram, and has usually narrower and not amplexicaul leaves. Var. *contorta* has usually amplexicaul leaves.

Anaphalis margaritacea (L.) Benth. et Hooker f., Gen. Pl. **2**: 303 (1873).

A. cinnamomea C. B. Clarke; *Antennaria cinnamomea* var. *angustior* Miquel.

Victoria Fall, 1950m (Apr. 3, 1960, after fl.); Darjeeling, 2100m & 2200m (Apr. 2, 1960; Mar. 14, & Dec. 26, 1963); Birch Hill, Darjeeling (Dec. 28, 1963); Gatribas–Tonglu (Sep. 17, 1964); Senchal, 2350m (Sep. 19, 1964); Kakani, 2100–2020m (Sep.

24, 1963); Sinduwa, 2100 m (Oct. 24, 1963); Bilbatay Bhanjang–Hati Sar, 2200-2700 m (Oct. 27, 1963); Helok–Baroya Khimty, 1500–2500 m (Nov. 10, 1963); Bhandukay-Ghatte, 2400–1600 m (Nov. 16, 1963); Thakma Khola–Yamphodin, 3500–2100 m (Nov. 17, 1963); below Siling Tzokupa–Siling Tzokupa, 2100–3800 m (Nov. 21, 1963); Bhuspate Danra–Mai Majuwa, 2900–1600 m (Dec. 3, 1963); Mai Majuwa–Dhara Pani, 1600–1500 m (Dec. 4, 1963).

Distr. Himalaya (Kashmir to Bhutan), Thai, Indo-China, China, Japan, Kamtschatka, Aleutian Islands, and N. America.

Anaphalis nepalensis Sprengel, Syst. Veg. **3**: 477 (1826)–Hand.-Mzt., Symb. Sin. **7**: 1099 (1936).

Anaphalis nubigea DC.; *A. monocephala* DC.; *A. Nagasawai* Hayata.

Jongri–Olothang, 3900 m (May 23, 1960, after fl.); along the Choktsering Chu, north of Jongri, 4000–4500 m (May 25, 1960).

Distr. Afghanistan, Himalaya, China (Yunnan, Szechuan, Sikang), and Formosa.

Anaphalis triplinervis (Sims) C. B. Clarke, Compos. Ind. 105 (1876).

Antennaria triplinervis Sims in Bot. Mag. t. 2468 (1824).

Kala Pokhari–Sandakphu (Sep. 16, 1963); Sinduwa, 2100 m (Oct. 23, 1963); Murhay–Bilbatay Bhanjang, 2000–2200m (Oct. 24, 1963); Minchin Dhap–Mul Pokhari, 2800–2400 m (Oct. 29, 1963); Taplejung–Garhi Danra, 2000–2200 m (Nov. 3, 1963); Helok, 1500m (Nov. 8, 1963); Zongi–Iladanda, 2600–1800m (Nov. 12, 1963); Thakma Khola–Yamphodin, 3300–2100 m (Nov. 17, 1963); Yamphodin–Ghatte, 2100–1600 m (Nov. 18, 1963); Birwa–Yektin, 2400–1700 m (Nov. 28, 1963); Yektin–Batasay, 1400-2400 m (Nov. 30, 1963).

var. **intermedia** (DC.) Airy-Shaw in Bot. Mag. t. 9396 (1935).

Senchal, 2400 m (Apr. 13, 1960, after fl.); Chia Bhanjang–Phalut, 3100–3600 m (Jun. 2, 1960, after fl.); Phalut–Sandakphu, 3000 m (Jun. 6, 1960, after fl.); Hati Sar–Minchin Dhap, 2700–2800 m (Oct. 28, 1963).

Distr. sp. Himalaya (Kashmir to Bhutan).

Artemisia dubia Wall. ex DC., Prodr. **6**: 110 (1838).

A. umbrosa Turcz.; *A. lavandulaefolia* DC., l.c. p.p.

Birch Hill, Darjeeling, 2100 m (Mar. 16 & Dec. 28, 1963); Dhankuta, 1200 m (Oct. 18, 1963); Mul Pokhari–Dumhan, 2400–1700 m (Oct. 30, 1963); Kathmandu Airport, 1400 m (Oct. 13, 1963).

Distr. Asia.

Artemisia indica Willd., Sp. Pl. **3**: 1846 (1804)–DC., Prodr. **6**: 114 (1838).

A. grata Wall. ex DC.

Butia Basti, 1900 m (Apr. 6, 1960); Batasi–Palmajua, 2300–2600 m (May 3, 1960); Dhankuta, 1200 m (Oct. 18, 1963); Dhankuta–Hilay, 1200–1800 m (Oct. 23, 1963); Minchin Dhap–Mul Pokhari, 2800–2400 m (Oct. 29, 1963); Mul Pokhari–Dumhan, 2400–700 m (Oct. 30, 1963); Tuwa–Taplethok, 1800–1300 m (Nov. 5, 1963); Ghatte-Khebang, 1600–1700 m (Nov. 19, 1963); Mai Majuwa–Dhara Pani, 1600–1500 m (Dec. 4, 1963); Illam–Ranga Pani, 1200–700 m (Dec. 8, 1963); Ranga Pani–Ghorwa, 700-300 m (Dec. 9, 1963).

Distr. India, Burma, Thai, S. China, and S. Japan.

After Mr. Hiroshige Koyama the chromosome number of the plant collected at Darjeeling in 1960 is $2n=34$. The chromosome number of Japanese plant is also $2n=34$.

The leaves of the Nepalese plants are densely silky pilose on the surface.

Artemisia japonica Thunb., Fl. Jap. 310 (1784).

Gokarna Forest, northeast of Kathmandu, 1500 m (Sep. 22, 1963); Helok, 1500 m (Nov. 8, 1963); above Lelep, 2600 m (Nov. 9, 1963); Iladanda-Helok, 1800-1500 m (Nov. 13, 1963).

Distr. From Afghanistan to Japan.

Aster albescens (DC.) Handel-Mazzetti in Act. Hort. Gothob. **12**: 205 (1958).

Amphirhaphice albescens DC. (1836); *Microglossa albescens* (DC.) C. B. Clarke.

Selap-Walunchung Gola, 2600-3500 m (Nov. 10, 1963, after fl.).

Distr. Himalaya, Assam, Burma, and W. China.

A shrub. Leaves glabrous. Achenes 4-5 ribbed.

Aster sikkimensis Hooker f. et Thoms. in Bot. Mag. t. 4557 (1851)-Fl. Brit. Ind. **3**: 252 (1881)-Grierson in Not. Bot. Gard. Edinb. **26**: 111 (1964).

Hati Sar-Minchin Dhap, 2700-2800 m (Oct. 28, 1963); Minchin Dhap-Mul Pokhari, 2800-2400 m (Oct. 29, 1963); Baroya Khimty-Thakma Khola, 2500-3100 m (Nov. 12, & 16, 1963); Diorali Bhanjang-Bhandukay, 1500-2400 m (Nov. 14, 1963); Thakma Khola-Yamphodin, 3300-2100m (Nov. 17, 1963); below Siling Tzokupa-Siling Tzokupa, 2100-3800 m (Nov. 21, 1963).

Distr. E. Himalaya (Nepal, Sikkim).

A perennial large plant. Leaves amplexicaul. Involucral scales acuminate.

Aster sikkimensis collected by the expedition 1963 is cultivated at Karuizawa, Japan. According to the living material, the colour of disk floret, before opening (accordingly outside of corolla) is yellow green without shade of brown, and after opening (inside of corolla) is dirty white with the top red brown. The colour of ray florets is purple.

Bidens bipinnata L., Sp. Pl. ed. 1, 832 (1753).

Kathmandu Airport, 1400 m (Oct. 13, 1963); Phusri-Dhara Pani (Oct. 16, 1963).

Distr. Cosmopolitan.

Bidens pilosa L., Sp. Pl. ed. 1, 832 (1753).

Siliguri-Kurseong (Apr. 29, 1960); Phusri-Dhara Pani. 450-900m (Oct. 16, 1963); Tamur Bridge-Dhankuta, 900-1200 m (Oct. 17, 1963); Dhankuta, 1200 m (Oct. 21, 1963); Helok, 1500m (Nov. 7 &9, 1963); Khebang, 1400m (Nov. 23, 1963); Tharpu, 1200 m (Nov. 26, 1963); Dhara Pani-Illam, 1500-1200 m (Dec. 5, 1963).

Distr. Pantropic.

Bidens tripartita L., Sp. Pl. ed. 1, 831 (1753).

Mul Pokhari-Dumhan, 2400-700 m (Oct. 30, 1963).

Distr. Northern Hemisphere.

Blainvillea latifolia (L. f.) DC. in Wight, Contr. 17 (1834).

Eclipta latifolia L. f., Suppl. Pl. 378 (1781).

Dhara Pani-Dhankuta, 900-1200 m (Oct. 17, 1963).

Distr. Pantropic.

Blumea balsamifera DC., Prodr. **5**: 447 (1836)-Randeria in Blumea **10**: 237 (1960).

Tista-Rangpo, 350 m (Mar. 17, 1963).

Distr. Himalaya, India, Malaya, S. China, and Formosa.

Blumea hieraciifolia (D. Don) DC. in Wight, Contr. 15 (1834)-Randeria, l.c. 246 (1960).

Erigeron hieracifolium D. Don, Prodr. Fl. Nepal. 172 (1825).

B. sericans Hooker f., Fl. Brit. Ind. **3**: 262 (1881).

Kalimpong, 1300m (Apr. 23 & Jun. 20, 1960); Khebang–Bharomdin, 1700–1000m (Nov. 24, 1963); Tharpu–near Chyangthaphu, 1200–1100 m (Nov. 26, 1963).

Distr. Himalaya, India, Burma, Thai, Indo-China, China, Ryukyu, Philippines, and New Guinea.

Blumea lacera (Burm. f.) DC. in Wight, Contr. 14 (1834)–Randeria, l.c. 264 (1960).

Conyza lacera Burm. f., Fl. Ind. 180, t. 59, fig. 1 (1768).

Ranga Pani–Ghorwa, 700–300m (Dec. 9, 1963); Sibganja–Mahara Bahara, 200m (Dec. 12, 1963); Mahara Bahara–Kathgara, 200 m (Dec. 13, 1963); Dharan, 200 m (Dec. 15, 1963).

Distr. Tropics of the Old World.

Blumeopsis falcata (D. Don) Merrill in Journ. Arn. Arb. **19**: 70 (1938).

Erigeron falcatum D. Don, Prodr. Fl. Nepal. 172 (1825).

Blumea falcata DC. (1836); *Laggera flava* Benth.; *Blumeopsis flava* Gagnep.

Dhara Pani–Dhankuta, 900–1200 m (Oct. 17, 1963); Mul Pokhari–Dumhan, 2400–700 m (Oct. 30, 1963); Taplejung, 800 m (Oct. 31, 1963); Bharomdin–Tharpu, 1000–1200 m (Nov. 25, 1963); Tharpu–near Chyangthaphu, 1200–1100 m (Nov. 26, 1963); Illam–Ranga Pani, 1200–700 m (Dec. 8, 1963); Ranga Pani–Ghorwa, 700–300 m (Dec. 9, 1963).

Distr. Himalaya, India, Burma, Thai, Indo-China, and China.

Caesulia axillaris Roxb., Pl. Corom. **1**: 64 t. 93 (1798)–Andrews, Bot. Rep. **6**: t. 431 (1805)–DC., Prodr. **5**: 482 (1836).

Meyera orientalis D. Don, Prodr. Fl. Nepal. 180 (1825).

Kathmandu Airport, 1400 m (Oct. 13, 1963); Biratnagar, 200 m (Oct. 15, 1963); Mahara Bahara–Kathgara, 200 m (Dec. 13, 1963); Sibganja–Gauriganja, 200m (Dec. 12, 1963); Kathgara–Rangali, 200 m (Dec. 14, 1963).

Distr. Himalaya, India, and Burma.

Carpesium abrotanoides L., Sp. Pl. ed. 1, 860 (1753).

Taplethok–Helok, 1300–1500 m (Nov. 6, 1963); Ghatte–Khebang, 1600–1700 m (Nov. 19, 1963).

Distr. Europe, Caucasus, Asia Minor, Iran, Himalaya, Indo-China, China, Korea, and Japan.

The type locality of *C. abrotanoides* is near Kwangtung, China. *C. abrotanoides* in China and Japan is very common and variable.

The upper leaves are mostly oblong-lanceolate or rather rarely lanceolate. The Himalayan specimens have lanceolate upper leaves, as figured in Fl. URSS **25**: tab. 31–5. As the achenes are sticky, this species easily spreads. The distribution from Europe to Iran, may be considered as introduced by human agency.

Carpesium nepalense Less. in Linnaea **6**: 234 (1832)–DC., Prodr. **6**: 281 (1838)–Kitamura in Faun. & Fl. Nepal Himal. 250 (1955).

C. cernuum L. sensu Hooker f., Fl. Brit. Ind. **3**: 301 (1881), p.p.

C. cernuum var. *glandulosum* Hooker f., l.c. 301 (1881).

C. acutum Hayata, Fl. Mont. Formos. 133 (1908).

Dhankuta–Murhay, 1200–2000 m (Oct. 23, 1963); Sinduwa, Dhankuta Dist., 2100 m (Oct. 23 & 24, 1963); Bilbatay Bhanjang, 2200 m (Oct. 24 & 26, 1963); Baroya Khimty–Thakma Khola, 2500–3100 m (Nov. 12, 1963); Birwa–Yektin, 2400–1700 m (Nov. 28, 1963); Lagyap, Gangtok, 2200 m (Sep. 13, 1964).

Distr. Himalaya, China, and Formosa.

The leaves membranous, not so densely lanate, glandular punctate, abruptly petiolate, and involucral scales acute.

var. **lanatum** (T. Thom. ex C. B. Clarke) Kitamura, comb. nov.

C. cernuum (α) *lanatum* T. Thom. ex C. B. Clarke, Comp. Ind. 130](1876)–Fl. Brit. Ind. **3**: 301 (1881).

C. nepalense Less. sensu Wight, Icon. t. 1120 (1846).

Sinduwa, 2100 m (Oct. 24, 1963); Helok–Baroya Khimty, 1500–2500 m (Nov. 15, 1963).

Distr. E. Himalaya (Nepal, Sikkim), and Khasia.

The leaves thicker densely villose, gradually angustate to petiole, and the heads a little larger, 12–20 mm in diam., with acute involucral scales.

Carpesium cernuum has obtuse involucral bracts. This species was first described from Italy, and is now widely distributed in southern Europe and Caucasus, not yet found in Siberia, except far east region, and is not rare in Japan and China. Thus, the distribution is disjunctive. The introduction of *C. cernuum* into Europe from China must be taken into consideration.

Carpesium tracheliifolium Less. in Linnaea **6**: 233 (1831).

Godavari near Kathmandu, 1500 m (Sep. 18, 1963).

Distr. Himalaya, and China.

Centipeda minima (L.) A. Br. et Aschers., Ind. Sem. Hort. Berol. App. 6 (1867).

Artemisia minima L., Sp. Pl. ed. 1, 849 (1753).

Rayang, 250 m (Apr. 20, 1960); Kathmandu Airport, 1400 m (Oct. 13, 1963); Dhankuta, 1200 m (Oct. 19, 1963); Dumhan, Taplejung Dist., 700 m (Oct. 31, 1963); Bharomdin–Tharpu, 1000–1200 m (Nov. 25, 1963); Tharpu–near Chyangthaphu, 1200–1100 m (Nov. 26, 1963).

Distr. Africa, Asia, and Australia.

Chrysanthemum indicum L., Sp. Pl. ed. 1, 889 (1753).

Dhankuta, cult., 1200 m (Oct. 21, 1963, heads 2–2 cm in diam.); Dumhan–Taplejung, cult., 700–2000 m (Oct. 31, 1963); Bharomdin–Tharpu, cult., 1000–1200 m (Nov. 25, 1963, heads 2.5–2.8 cm in diam.); Tharpu, cult., 1200 m (Nov. 26, 1963, heads 1.8 cm in diam.).

Distr. A native of China and Japan.

All specimens have heads with many series of ligules.

Chrysanthemum morifolium Ramat. in Journ. Hist. Nat. **32**: 240 (1792).

Iladanda–Helok, cult., 1800–1500 m (Nov. 13, 1963, heads 9–10 cm in diameter); Khebang, cult., 1400 m (Nov. 23, 1963, heads 4–5 cm in diam.).

Distr. Cultivated plant.

Cicerbita cyanea (D. Don) Beauverd in Bull. Soc. Bot. Genève sér. 2, **2**: 132 (1910).

Sonchus cyaneus D. Don, Prodr. Fl. Nepal. 164 (1825).

Lactuca hastata DC., Prodr. **7**: 139 (1838).

C. cyanea var. *glandulifera* (Franchet) Beauverd, l.c. 132 (1910).

Sinduwa, 2100 m (Oct. 23 & 24, 1963, before fl.); Bilbatay Bhanjang, 2100 m (Oct. 25, 1963, before fl.); Bilbatay Bhanjang–Hati Sar, 2200–2700 m (Oct. 27, 1963); Mul Pokhari–Dumhan, 2400–700 m (Oct. 30, 1963); Helok–Iladanda, 1500–1800 m (Nov. 8, 1963); Baroya Khimty, 2500 m (Nov. 11, 1963); Thakma Khola–Yamphodin, 3300–2100 m (Nov. 17, 1963).

Distr. Himalaya (Kashmir to Sikkim), Khasia, and China (Yunnan).

Cicerbita macrantha (Clarke) Beauverd, l.c. 130 132 (1910).

Lactuca macrantha C. B. Clarke, Compos. Ind. 267 (1876).

Sandakphu–Garibans, 3600–2800 m (Sep. 17, 1964).

Distr. Himalaya (Nepal to Bhutan).

Cicerbita macrorhiza (Royle) Beauverd in Bull. Soc. Bot. Genève sér. 2, **2**: 134 (1910).

var. **saxatilis** (Edgew.) Beauv., l.c. 135 (1910).

Melanoseris saxatilis Edgew. in Proc. Linn. Soc. **20**: 79 (1851).

Lactuca Hoffmeisteri Klotzsch in Ergebnisse der Reise Pr. Waldemar. 81 (1862).

Below Siling Tzokupa (Nov. 21, 1963).

Distr. sp. Himalaya (Kashmir to Sikkim).

Cirsium argyracanthum DC., Prodr. **6**: 640 (1838).

Rimbick–Ramam, 1900–2400 m (May 7, 1960).

Distr. Himalaya (Muree to Bhutan).

Cirsium verutum (D. Don) Sprengel, Syst. Veg. **3**: 370 (1826).

Cnicus verutus D. Don, Prodr. Fl. Nepal. 167 (1825).

C. involucratum DC., Prodr. **6**: 639 (1838).

Selap–Waluchung Gola (Nov. 10, 1963); Thakma Khola–Bhandukay, 3200–2400 m (Nov. 14, 1963); Thakma Khola–Yamphodin, 3300–2100 m (Nov. 17, 1963).

Distr. Himalaya (Kashmir to Bhutan).

Hooker f. treated *Cnicus verutus* as a synonym of *C. argyracanthum* with ?. The original description of *Cnicus verutus* D. Don indicates the leaves spinulose on the surface. The leaves of *C. argyracanthum* are not spinulose on the surface.

Cirsium Wallichii DC. var. **glabratum** (Hooker f.) Wendelbo in Nytt Mag. Bot. **1**: 67 (1952)–Kitamura, Fl. Afghan. 408 (1960).

Cnicus Wallichii DC. var. *glabrata* Hooker f., Fl. Brit. Ind. **3**: 364 (1881).

Iladanda–Selap, 1800–2600 m (Nov. 9, 1963); Iladanda–Helok, 1800–1500 m (Nov. 13, 1963).

Distr. From Afghanistan to China, through Himalaya.

Conyza angustifolia Roxb. [Hort. Beng. 61 (1814), nom. nud.] Fl. Ind. ed. 2, **3**: 429 (1832).

Pamianchi–Tingling Bridge, 2000–1000 m (May 15, 1960).

Distr. E. Himalaya (Sikkim).

Conyza japonica Less., Syn. Compos. 204 (1832).

Butia Basti, Darjeeling, 1800 m (Apr. 6, 1960); Mani Bhanjang–Batasi, 2000 m (May 1, 1960); Kathmandu Airport, 1400 m (Oct. 13, 1963); Dhankuta, 1200 m (Oct. 20, 1963); Illam, 1200 m (Dec. 7, 1963).

Distr. From Afghanistan to Japan, through India, Burma, Thai, Indo-China, and China.

Conyza stricta Willd., Sp. Pl. **3**: 1922 (1803).

var. **stricta**.

Kathmandu Airport, 1400 m (Oct. 13, 1963); Phusri-Dhara Pani (Oct. 11, 1963); Dhara Pani-Dhankuta, 900–1200 m (Oct. 17, 1963); Dhankuta, 1200 m (Oct. 18, 1963); Tharpu-near Chyangthaphu, 1200–1100 m (Nov. 26, 1963).

var. **pinnatifida** (D. Don) Kitamura, stat. nov.

Erigeron pinnatifidum D. Don, Prodr. Fl. Nepal. 172 (1825).

E. trisulcum D. Don, l.c. (1825).

Conyza pinnatifida Roxb.; *C. absinthifolia* DC.

Hilay-Murkay, 1800–2000 m (Oct. 23, 1963); Mul Pokhari-Dumhan, 2400–700 m (Oct. 30, 1963); Taplejung-Heydewa-Garhi Danra (Nov. 3, 1963); Yamphodin-Ghatte, 2100–1600 m (Nov. 18, 1963).

Distr. sp. Eastern Africa, India, Burma, and Thai (var. *stricta*).

Conyza viscidula Wall. ex DC., Prodr. **5**: 383 (1836).

Illam-Ranga Pani, 1200–700 m (Dec. 8, 1963).

Distr. Himalaya (Simla eastwards), India, Burma, Malaya, Thai, Indo-China, China, Formosa, Philippines, Java, New Caledonia, and Australia.

Crassocephalum crepidioides (Benth.) S. Moore in Journ. Bot. **1912**: 211 (1912).

Gynura crepidioides Benth. in Hooker, Niger Fl. 438 (1849).

Happy Valley, Darjeeling, 1900 m (Apr. 10, 1960); Dentam-Pamianchi, 1700 m (May 12, 1960); Saramsa, 1100 m (Mar. 21, 1963); Kathmandu Airport, 1400 m (Oct. 13, 1963); Dhankuta, 1200 m (Oct. 19, 1963); Khebang-Bharomdin, 1700–1000 m (Nov. 24, 1963); Tharpu, 1200 m (Nov. 26, 1963).

Distr. A native of tropical Africa, now naturalized widely in warm countries.

Cremanthodium reniforme Bentham in Hook., Icon. Pl. t. 1141 (1873)-Fl. Brit. Ind. **3**: 330 (1881). [Pl. 6 a]

Sandakphu, 3600 m (Sep. 16, 1964, fl.).

Distr. E. Himalaya (Nepal, Sikkim).

Cyathocline purpurea (Ham. ex D. Don) O. Kuntze, Rev. Gen. Pl. 333 (1891).

Tanacetum purpureum Ham. ex D. Don, Prodr. Fl. Nepal. 181 (1825).

C. lyrata Cass.

Mul Pokhari-Dumhan, 2400–700 m (Oct. 30, 1963); Iladanda-Selap, 1800–2600 m (Nov. 9, 1963); Bharomdin-Tharpu, 1000–1200 m (Nov. 25, 1963); Illam-Ranga Pani, 1200–700 m (Dec. 8, 1963).

Distr. Himalaya (Kashmir to Bhutan), India, Burma, Thai, Indo-China, and China.

Dahlia imperialis Roezl in Gart. Fl. **1863**: 243, t. 407.

Bharomdin-Tharpu, cult., 1000–1200 m (Nov. 25, 1963); Khunga-Yektin, cult., 2000–1700 m (Nov. 28, 1963); Mai Majuwa-Dhara Pani, cult., 1600–1500 m (Dec. 4, 1963).

Distr. A cultivated plant; native of Mexico.

Dichrocephala Benthamii C. B. Clarke, Compos. Ind. 36 (1876).

Mani Bhanjang-Batasi, 2000 m (May 1, 1960); Bilbatay Bhanjang-Hati Sar, 2200–

2700 m (Oct. 27, 1963); Helok-Baroya Khimty, 1500–2500 m (Nov. 15, 1963).

Distr. India, and Indo-China.

Dichrocephala integrifolia (L. f.) O. Kuntze, Rev. Gen. Pl. 333 (1891).

Hippia integrifolia L. f., Suppl. Pl. 389 (1781).

D. latifolia DC.; *D. bicolor* (Roth) Schlecht.; *Cotula bicolor* Roth.

Rimbick, 2200 m (May 5, 1960); Darjeeling, 1900 m (Jun. 21, 1960); Siliguri-Kurseong, 1400–1550 m (Apr. 9, 1960); Happy Valley, 1900 m (Apr. 10, 1960); Mani Bhanjang-Batasi, 2000–2150 m (May 1, 1960); Gangtok, 1600 m (Apr. 26, 1960), Gangtok, 1650 m (Jun. 16, 1960); Tingling Bridge–Yoksam, 1000–1700 m (May 16, 1960); Dhankuta, 1200 m (Oct. 20, 1963); (Oct. 21, 1963); near Chyangthaphu-Birwa, 1100–2400 m (Nov. 27, 1963).

Distr. Tropical and subtropical Asia, and Africa.

Dubyaea hispida DC., Prodr. **7**: 247 (1838).

Hieracium hispidum D. Don, Prodr. Fl. Nepal. 165 (1825), nom. illeg.

Lactuca Dubyaea C. B. Clarke, Compos. Ind. 271 (1876).

Sandakphu, 3600 m (Sep. 17, 1964).

Distr. Himalaya (Kumaon to Bhutan), Burma, Tibet, and W. China (Yunnan, Szechuan).

Eclipta prostrata L., Mant. Pl. **2**: 286 (1771).

E. alba Hassk.

Rayang, 250 m (Apr. 20, 1960); Tista, 300 m (Jun. 19, 1960); Kathmandu–Thankot, 1400–1300 m (Sep. 19, 1963); Kathmandu Airport, 1400 m (Oct. 13, 1963); Dumhan, 700 m (Oct. 31, 1963); Bharomdin–Tharpu, 1000–1200 m (Nov. 25, 1963); Tharpu-near Chyangthaphu, 1200–1100 m (Nov. 26, 1963); near Chyangthaphu–Birwa, 1100–2400 m (Nov. 27, 1963); Rangali–Biratnagar, 200 m (Dec. 15, 1963).

Distr. Pantropic.

Elephantopus scaber L., Sp. Pl. ed. 1, 814 (1753).

Phusri–Dhara Pani, 450–900 m (Oct. 16, 1963); Tamur Bridge–Dhankuta, 900–1200m (Oct. 17, 1963); Dhankuta, 1200m (Oct. 18 & 19, 1963); Dumhan, 800m (Oct. 31, 1963); Dumhan–Taplejung (Nov. 1, 1963); Bharomdin–Tharpu, 1200m (Nov. 25, 1963); Ranga Pani–Loohya Mai, 700–300 m (Dec. 9, 1963); Ghorwa-Sanichare, 300–200 m (Dec. 10, 1963).

Distr. Tropical and subtropical Asia, Africa, and Australia.

Emilia sonchifolia (L.) DC. in Wight, Contr. 24 (1834); Prodr. **6**: 302 (1838).

Cacalia sonchifolia L., Sp. Pl. ed. 1, 835 (1753).

Saramsa Medicinal Garden, 800 m (Jun. 17, 1960); Dhankuta, 1200 m (Oct. 19, 1963); Mul Pokhari–Dumhan, 2400–700 m (Oct. 30, 1963); Dumhan, 700 m (Oct. 31, 1963); below Siling Tzokupa–Khebang, 2100–1700 m (Nov. 22, 1963).

Distr. Tropical and subtropical regions of Asia, and Africa.

Erigeron canadensis L., Sp. Pl. ed. 1, 863 (1753).

Chobar Gorge, south of Kathmandu, 1400 m (Sep. 21, 1963).

Distr. An introduced cosmopolitan weed of North American origin.

Erigeron sumatrensis Retz., Obs. Bot. **5**: 28 (1787).

Pamianchi–Tingling Bridge, 2000–1000 m (May 15, 1960); Kathmandu Airport, 1400 m (Oct. 13, 1963); Taplejung, 2000 m (Nov. 2, 1963); Taplethok–Helok, 1300–1500 m (Nov. 6, 1963); Helok, 1500 m (Nov. 7, 1963); Bharomdin–Tharpu, 1000–

1200 m (Nov. 25, 1963); near Chyangthaphu-Birwa, 1100-2400 m (Nov. 27, 1963).

Distr. A pantropic weed; native of South America.

Eupatorium adenophorum Sprengel, Syst. Veg. **3**: 420 (1826)-Koster in Blumea **1**: 502 (1935).

E. glandulosum H. B. K., Nov. Gen. et Sp. **4**: 122 (1820); non Michaux (1803).

Takdah, Darjeeling, 1500m (Apr. 18, 1960); Mani Bhanjang-Batasi (May 1, 1960); Tingling Bridge-Yoksam, 1000 m-1700 m (May 16, 1960).

Distr. A pantropic weed; native of Mexico.

Eupatorium capillifolium (Lam.) Small in Mem. Torrey Bot. Cl. **5**: 311 (1894).

Artemisia capillifolia Lamarck, Encycl. Méth. **1**: 266 (1783).

E. foeniculaceum Willd., Sp. Pl. **3**: 1750 (1804).

Biratnagar, 200 m (Oct. 14, 1963).

Distr. An introduced weed; native of America.

Eupatorium odoratum L., Syst. Nat. ed. 10, 1205 (1759).

Tharpu-near Changthaphu, 1200-1100 m (Nov. 26, 1963, before fl.); Dhara Pani-Illam, 1500-1200 m (Dec. 5, 1963, before fl.); Illam-Ranga Pani, 1200-700 m (Dec. 8, 1963).

Distr. An introduced weed; native of America.

Galinsoga ciliata (Raf.) Blake in Rhodora **24**: 35 (1922).

Adventina ciliata Rafin., New Fl. Am. **1**: 67 (1836).

Kathmandu Airport, 1400 m (Oct. 13, 1963).

Distr. A native of North America, now widely naturalized in the World.

The achenes of ligular floret have distinct pappus. The pappus bristles of tubular floret are caudate acuminate.

Galinsoga parviflora Cav., Icon. **3**: 41, t. 281 (1794).

Darjeeling, 1900m (Jun. 21, 1960); Happy Valley, 1900m (Apr. 10, 1960); Pamianchi-Ratong Chu, 900m (May 15, 1960); Dhankuta, 1200m (Oct. 20, 1963); Dhankuta-Murhay, 1200-2000 m (Oct. 23, 1963); Helok-Iladanda, 1500-1800m (Nov. 8, 1963); Khebang, 1400 m (Nov. 23, 1963); Tharpu, 1200 m (Nov. 26, 1963); Illam, 1200 m (Dec. 7, 1963).

Distr. A native of America; now widely naturalized in the World.

Gerbera maxima (D. Don) Beauverd in Bull. Soc. Bot. Genève sér. 2, **2**: 44 (1910).

G. macrophylla Benth.; *Chaptalia maxima* D. Don (1825).

Tuwa-Taplethok, 1800-1300 m (Nov. 5, 1963); Taplethok-Helok, 1300-1500 m (Nov. 6, 1963); Helok-Iladanda, 1500-1800m (Nov. 8, 1963); Baroya Khimty, 2500m (Nov. 11, 1963); Iladanda-Helok, 1800-1500 m (Nov. 13, 1963).

var. **glabrata** (Hooker f.) Kitamura in Faun. & Fl. Nepal Himal. 259 (1955).

Below Siling Tzokupa-Siling Tzokupa, 2100-3800 m (Nov. 21, 1963); Yamphodin-Ghatte, 2100-1600 m (Nov. 18, 1963); Birwa-Yektin, 2000-1700 m (Nov. 28, 1963).

Distr. sp. Himalaya (Garhwal to Bhutan), Khasia, and Thai.

Gnaphalium affine D. Don, Prodr. Fl. Nepal. 173 (1825).

G. multiceps Wall. ex DC., Prodr. **6**: 222 (1838).

Darjeeling, 2000m (Apr. 2, 1960); Senchal-Takdah (Apr. 17, 1960); Mani Bhanjang-Batasi (May 1, 1960); Mul Pokhari-Dumhan, 2400-700 m (Oct. 30, 1963); Helok, 1500 m (Nov. 8, 1963); Taplejung–Garhi Danra (Nov. 9, 1963); Helok–Baroya Khimty, 1500–2500 m (Nov. 15, 1963); Khebang–Bharomdin, 1700–1000 m (Nov. 24, 1963).

Distr. Himalaya, Tibet, India, Burma, Thai, Indo-China, Java, China, and Japan.

Gnaphalium hypoleucum DC. in Wight, Contr. 21 (1834); Prodr. **6**: 222 (1838).

Pamianchi–Tingling Bridge, 2000–1000 m (May 15, 1960).

Distr. India, Burma, Thai, Indo-China, Philippines, China, and Japan.

Gnaphalium indicum L., Sp. Pl. ed. 1, 852 (1753).

Gangtok, 1650 m (Apr. 26, 1960); Sibganja–Mahara Bahara, 200 m (Dec. 12, 1963); Mahara Bahara–Kathgara, 200 m (Dec. 13, 1963).

Distr. India, Burma, Thai, Indo-China, China, and Japan (introduced recently).

All the specimens here enumerated have spathulate leaves.

Guizotia abyssinica Cass. in Dict. Sci. Nat. **59**: 248 (1829).

Phusri–Dhara Pani, 450–900 m (Oct. 16, 1963); Dhara Pani–Dhankuta, 900–1200 m (Oct. 17, 1963); Dhankuta, 1200 m (Oct. 20, 1963); Mul Pokhari–Dumhan, 2400–700 m (Oct. 30, 1963); Khebang, 1400 m (Nov. 23, 1963); Bharomin–Tharpu, 1000–1200 m (Nov. 25, 1963); Tharpu, 1200 m (Nov. 26, 1963). All specimens here enumerated were cultivated.

Distr. A native of tropical Africa; cultivated in India for oily seeds.

Gynura Cusimbua (D. Don) S. Moore in Journ. Bot. **1912** (1): 212 (1912).

G. angulosa DC.; *Cacalia Cusimbua* D. Don (1825).

Darjeeling, 2200 m (Dec. 26, 1963); Sinduwa, 2100 m (Oct. 23 & 24, 1963); Dhankuta–Murhay, 1200–2000 m (Oct. 23, 1963); below Siling Tzokupa–Khebang, 2100–1700 m (Nov. 22, 1963).

Distr. Himalaya (Garhwal to Mishmi), Khasia, Decan, Burma, Martaban, Thai, and W. China (Yunnan).

Gynura nepalense DC., Prodr. **6**: 300 (1838).

Takdah, Darjeeling, 250 m (Apr. 20, 1960); Rhenock, 1100 m (Mar. 19, 1963).

Distr. Himalaya (Kumaon to Bhutan), Assam, Burma, and Thai.

Gynura Pseudo-china DC., Prodr. **6**: 299 (1838).

Senecio Pseudo-china L., Sp. Pl. ed. 1, 867 (1753).

Peshok, Darjeeling, 900 m (Apr. 27, 1960).

Distr. Himalaya, India, Ceylon, Java, Thai, Indo-China, and China.

Inula Cappa DC., Prodr. **5**: 469 (1836).

Phusri–Dhara Pani, 450–900 m (Oct. 16, 1963); Dhara Pani–Tamur Bridge–Dhankuta, 900–1200 m (Oct. 17, 1963); Dhankuta, 1200 m (Oct. 21, 1963); Mul Pokhari–Dumhan, 2400–700 m (Oct. 30, 1963); Helok, 1500 m (Nov. 7, 1963); Dhara Pani–Illam, 1500–1200 m (Dec. 5, 1963); Illam, 1200 m (Dec. 6, 1963); Ranga Pani–Ghorwa, 700–300 m (Dec. 9, 1963, leaves less hairy.).

Distr. Himalaya to China.

Inula eupatorioides DC., Prodr. **5**: 469 (1836).

Dhara Pani–Illam, 1500–1200 m (Dec. 5, 1963).

Distr. Himalaya (E. Nepal to Bhutan), Khasia, Burma, Thai, and W. China (Yunnan).

Inula nervosa Wall. ex DC., Prodr. **5**: 47 (1836).

Helok–Iladanda, 1500–1800 m (Nov. 8, 1963); Iladanda–Selap, 1800–2600 m (Nov. 9, 1963); Baroya Khimty–Thakma Khola, 2500–3300 m (Nov. 12, 1963); Zongi–Iladanda, 2600–1800 m (Nov. 13, 1963); Thakma Khola, 3300 m (Nov. 16, 1963).

Distr. Himalaya (Garhwal to Bhutan), and Khasia.

Lactuca dolichophylla Kitamura, nom. nov.

Mulgedium sagittatum Royle, Ill. Bot. Himal. 252, t. 61, f. 2 (1835).

L. longifolia (non Michaux 1803) DC., Prodr. **7**: 135 (1838).

Helok–Iladanda, 1500–1800 m (Nov. 8, 1963).

Distr. Afghanistan (Nuristan), Himalaya (Kashmir to Nepal), and W. China (Yunnan).

Lactuca rostrata (Bl.) O. Kuntze, Rev. Gen. Pl. **1**: 349 (1891)–Boerl., Handl. Fl. Ned. Indië **2**: 1: 245 (1891).

Prenanthes rostrata Bl., Bijdr. 836 (1825)–DC., Prodr. **7**: 195 (1838).

L. graciliflora DC., Prodr. **7**: 139 (1838)–Fl. Brit. Ind. **3**: 406 (1881).

Kurseong, 1600 m (Apr. 12, 1960, after fl.); Gatribas, 2800 m (Sep. 16, 1964). Murhay–Bilbatay Bhanjang, 2000–2200 m (Oct. 24, 1963); Sinduwa, 2100 m (Oct, 24, 1963); Minchin Dhap–Mul Pokhari, 2800–2400 m (Oct. 29, 1963); Mul Pokhari -Dumhan, 2400–700 m (Oct. 30, 1963); above Lelep, 2600 m (Nov. 9, 1963); Zongi–Iladanda, 2600–1800 m (Nov. 12, 1963); Baroya Khimty–Thakma Khola, 2500–3300 m (Nov. 12, 1963); Thakma Khola–Yamphodin, 3300–2100 m (Nov. 17, 1963); Batasay–Bhuspate Danra, 2400–2900 m (Dec. 1, 1963).

Distr. Himalaya (Nepal to Bhutan), Java, Sumatra, and W. China (Yunnan, Szechuan).

The inner involucral scales are 3, not 5–6 erroneously described by Hooker f.

Laggera alata (D. Don) Schulz-Bipontinus ex Oliver in Trans. Linn. Soc. **39**: 94 (1873).

Erigeron alatum D. Don, Prodr. Fl. Nepal. 171 (1825).

Dhara Pani–Dhankuta, 900–1200 m (Oct. 17, 1963); Dhankuta, 1200 m (Oct. 18 & 19, 1963); Khebang–Bharomdin (Nov. 24, 1963); Ranga Pani–Ghorwa, 700–300 m (Dec. 9, 1963).

Distr. Tropical Africa, India, Thai, Indo-China, Java, Philippines, and China.

Leibnitzia nepalensis (Kunze) Kitamura in Journ. Jap. Bot. **14**: 297 (1938).

Cleistanthium nepalensis Kunze in Bot. Zeit. **9**: 350 (1851).

Gerbera Kunzeana A. Br. et Aschers.

Sandakphu, Darjeeling, 3600 m (May 7, 1960); Phalut, 3000–3500 m (May 9, 1960); Phalut–Sandakphu, 3200 m (Jun. 6, 1960).

Distr. Himalaya (Kashmir to Bhutan).

Mikania cordata (Burm. f.) R. L. Robinson in Contr. Gray Herb. **104**: 65 (1934).

Eupatorium cordatum Burm. f., Fl. Ind. 176, t. 58, f. 2 (1768).

var. **indica** Kitamura, var. nov.

E. scandens Willd. sensu C. B. Clarke, Comp. Ind. 34 (1876)–Fl. Brit. Ind. **3**: 244 (1881).

Involucri squamae 3 mm longae. Corollae 2.5 mm longae. Pappus 2.5 mm longus.

Achenia 1.5 mm longa.

Illam–Ranga Pani, 1200–700 m (Dec. 8, 1963—Typus in TI).

Distr. India, Malay, and southern China.

Eupatorium cordatum was first described from Java, and not from India.

Mikania cordata var. *cordata* has larger heads. Involucral scales 6–7 mm. long. Corollas 3.5–5 mm long. Pappus 3.5–4 mm long. Achenes 3.5 mm long. Var. *cordata* is distributed in Java, Indo-China, southern China, and Formosa.

Myriactis nepalensis Less. in Linnaea **6**: 128, t. 2 (1831)–DC., Prodr. 5: 308 (1836)–Fl. Brit. Ind. **3**: 247 (1881).

M. Wallichii Less., l.c. 129 (1831).

Rimbick, Darjeeling, 2200 m (May 5, 1960); Gatribas–Sandakphu, 2800 m (Jun. 7, 1960 & Sep. 16, 1964); Gangtok–Saramsa Medicinal Garden, 800 m (Jun. 17, 1960); Kakani Hill, 2200 m (Sep. 24, 1963); Pouwa, Kathmandu, 1600 m (Oct. 9, 1963); Dhankuta–Sinduwa, 1200–2100 m (Oct. 22, 1963); Dhankuta–Murhay, 1200–2000 m (Oct. 23, 1963); Hati Sar–Minchin Dhap, 2700–2800 m (Oct. 28, 1963); Mul Pokhari, 2800–2400 m (Oct. 29, 1963); Taplejung, 1700 m (Nov. 2, 1963); Zongi–Iladanda, 2600–1800 m (Nov. 12, 1963, f. *Wallichii*); Iladanda–Helok (Nov. 13, 1963); above Lelep (Nov. 9, 1963); Thakma Khola–Yamphodin, 3300–2100 m (Nov. 17, 1963); near Chyangthaphu–Birwa, 1100–2400 m (Nov. 27, 1963); Batasay–Bhuspate Danra, 2400–2900 m (Dec. 1, 1963).

Distr. Caucasus, Iran, Turkestan, Afghanistan, Himalaya, Thai, Indo-China, and W. China (Yunnan, Szechuan).

As already mentioned by J. D. Hooker, l.c. 247, *M. nepalensis* and *M. Wallichii* are difficult to separate specifically. While Formosan *M. longepedunculata* is distinguished from *M. nepalensis* by its pinnatifid leaves. *M. nepalensis* has always dentate leaves.

Picris hieracioides L. subsp. **kaimaensis** Kitamura in Act. Phytotax. Geobot. **8**: 127 (1939).

P. hieracioides L. var. *indica* Wight, Icon. **3**: 1143 (1850).

Dentam–Pamianchi, 1500–2000 m (May 12, 1960); Tingling Bridge–Yoksam, 1000–1700 m (May 16, 1960).

Distr. Himalaya, Mongolia, Manchuria, and Korea.

Rhynchospermum verticillatum Reinwaldt ex Blume, Bijdr. 902 (1826).

Near Kathmandu, 1500 m (Sep. 18, 1963); Pouwa, Kathmandu, 1600 m (Oct. 9, 1963).

Distr. India, Burma, Indo-China, Malay Islands, China, and Japan.

Saussurea deltoidea (DC.) C. B. Clarke, Compos. Ind. 235 (1876)–Fl. Brit. Ind. **3**: 374 (1881)–Kitamura in Act. Phytotax. Geobot. **19**: 13 (1961).

Gangtok, Lagyap, 2200 m (Sep. 13, 1964); Sinduwa, 2100 m (Oct. 24, 1963); Minchin Dhap–Mul Pokhari, 2800–2700 m (Oct. 29, 1963); Mul Pokhari–Dumhan, 2400–700 m (Oct. 30, 1963); above Lelep, 2600 m (Nov. 9, 1963); Zongi–Iladanda, 2600–1800 m (Nov. 12, 1963); Diorali Bhanjang–Bhandukay, 1500–3500 m (Nov. 14, 1963); Baroya Khimty–Thakma Khola (Nov. 16, 1963); Thakma Khola–Yamphodin, 3300–2100 m (Nov. 17, 1963); Ghatte, 1300 m (Nov. 17, 1963); Bhuspate Danra, 2600 m (Dec. 2, 1963); Senchal, 2350 m (Dec. 27, 1963); Gatribas–Tonglu, 2800–3000 m (Sep. 17, 1964).

Distr. Himalaya (Garhwal to Bhutan), Burma, Thai, China (Yunnan, Kweichow, Hupeh), and Formosa.

Saussurea microdeltoidea Kitamura in Act. Phytotax. Geobot. **19**: 14 (1961).

S. deltoidea γ. polycephala C. B. Clarke, Compos. Ind. 236 (1876).

S. deltoidea var. *nivea* C. B. Clarke sensu Gagnep. in Fl. Gén. Indo-Chin. **3**: 491, f. 467-13 in 489 (1924).

Helok–Iladanda, 1500–1800 m (Nov. 8, 1963); above Lelep, 2600 m (Nov. 9, 1963, after fl.); Iladanda–Selap, 1800–2600 m (Nov. 9, 1963).

Distr. E. Himalaya (Nepal, Sikkim), Assam, Thai, and Indo-China.

Senecio acuminatus DC., Prodr. **6**: 368 (1838).

Bilbatay Bhanjang–Hati Sar, 2200–2700 m (Oct. 27, 1963); Hati Sar–Minchin Dhap, 2700–2800 m (Oct. 28, 1963); above Lelep, 2600 m (Nov. 9, 1963); Batasay–Bhuspate Danra, 2400–2900 m (Dec. 1, 1963).

Distr. E. Himalaya (Nepal to Bhutan).

Senecio alatus Wall. ex DC., Prodr. **6**: 368 (1838).

Rimbick–Ramam, 1900–2400 m (May 1, 1960, after fl.); Bilbatay Bhanjang–Hati Sar, 2200–2700 m (Oct. 27, 1963); Hati Sar–Minchin Dhap, 2700–2800 m (Oct. 28, 1963); Minchin Dhap–Mul Pokhari, 2800–2400 m (Oct. 29, 1963); above Lelep, 2600 m (Nov. 9, 1963); Iladanda–Selap, 1800–2600 m (Nov. 9, 1963); Helok–Baroya Khimty, 1500–2500 m (Nov. 10, 1963); Baroya Khimty, 2500 m (Nov. 11, 1963); Zongi–Iladanda, 2600–1800 m (Nov. 12, 1963); Baroya Khimty–Thakma Khola, 2500–3300 m (Nov. 16, 1963); Thakma Khola–Yamphodin, 3300–2100 m (Nov. 17, 1963); Birwa–Yektin, 2400–1700 m (Nov. 28, 1963); Batasay–Bhuspate Danra, 2400–2900 m (Dec. 1, 1963).

Distr. Himalaya (Simla to Sikkim).

Senecio Buimalia Hamilt. ex D. Don, Prodr. Fl. Nepal. 178 (1825).

Yektin–Akasay, 1400–2300 m (Nov. 30, 1963, before fl.).

Distr. E. Himalaya (Nepal, Sikkim).

Senecio chrysanthemoides DC., Prodr. **6**: 365 (1838).

Tonglu, Darjeeling, 3000 m (Sep. 16, 1964); Sinduwa, 2100 m (Oct. 24, 1963); Murhay–Bilbatay Bhanjang, 2100–2200 m (Oct. 24, 1963); Minchin Dhap–Mul Pokhari, 2800–2400 m (Oct. 29, 1963).

Distr. sp. Himalaya (Kashmir to Bhutan), Khasia, and China (Yunnan, Szechuan, Kweichow).

The pappus of the ligular floret is poorly developed.

var. **spectabilis** DC., l.c. (1838).

Hati Sar–Minchin Dhap, 2700–2800 m (Oct. 28, 1963); Minchin Dhap–Mul Pokhari, 2800–2700 m (Oct. 29, 1963).

The puppus of the ligular floret is wanting.

Senecio densiflorus Wall. ex DC., Prodr. **6**: 369 (1838).

Orchid Sanctuary, Gangtok 1500 m (Mar. 18, 1963, after fl.); Sinduwa, 2100 m (Oct. 24, 1963); Garhi Danra–Tuwa, 2200–1800 m (Nov. 4, 1963); Helok–Iladanda, 1500–1800m (Nov. 8, 1963); above Lelep, 2600 m (Nov. 9, 1963); below Siling Tzokupa–Siling Tzokupa, 2100–3800 m (Nov. 21, 1963); Ghatte, 1300 m (Nov. 17, 1963); near Chyangthaphu–Birwa, 1100–2400 m (Nov. 27, 1963); Birch Hill, Darjeeling, 2100 m (Dec. 28, 1963).

Distr. sp. Himalaya (Nepal to Bhutan), Khasia Burma, and China (Yunnan, Szechuan).

var. **pubescens** Kitamura in Faun. & Fl. Nepal Himal. 271 (1955).

Murhay-Bilbatay Bhanjang, 2000–2200 m (Oct. 24, 1963); Hati Sar–Minchin Dap, 2700–2800 m (Oct. 28, 1963); Helok–Iladanda, 1500–1800 m (Nov. 12, 1963); Baroya Khimty–Thakma Khola, 2500–3100 m (Nov. 8, 1963); Bhandukay–Ghatte, 2400–1600 m (Nov. 16, 1963); below Siling Tzokupa–Siling Tzokupa, 2100–3800 m (Nov. 21, 1963).

Senecio graciliflorus DC., Prodr. **6**: 365 (1838).

Sinduwa, 2100 m (Oct. 24, 1963); Minchin Dhap–Mul Pokhari, 2800–2400 m (Oct. 29, 1963, after fl.); Selap–Walunchung Cola, 2600–3500 m (Nov. 10, 1963, after fl.).

Distr. Himalaya (Kashmir to Bhutan).

Senecio scandens Hamilt. ex D. Don, Prodr. Fl. Nepal. 178 (1825).

Bilbatay Bhanjang, 2200 m (Oct. 26, 1963); Minchin Dhap–Mul Pokhari, 2800–2400 m (Oct. 29, 1963); above Lelep, 2600 m (Nov. 9, 1963); Baroya Khimty, 2500 m (Nov. 11, 1963); Baroya Khimty–Thakma Khola, 2500–3100 m (Nov. 12 & 16, 1963); Siling Tzokupa, 3800 m (Nov. 21, 1963); Bhuspate Danra–Mai Majuwa, 2900–1600 m (Dec. 3, 1963); Tenzing Norgay Road, 2100 m (Dec. 25, 1963).

Distr. Himalaya (Kumaon eastwards), India, Thai, Indo-China, Philippines, China, and Japan.

Senecio tetranthus DC., Prodr. **6**: 370 (1838).

Bilbatay Bhanjang–Hati Sar, 2200–2700 m (Oct. 27, 1963); Hati Sar – Minchin Dhap (Oct. 28, 1963); Minchin Dhap–Mul Pokhari, 2800–2400 m (Oct. 29, 1963); Selap–Walunchung Gola, 2600–3500 m (Nov. 10, 1963); Diorali Bhanjang–Bhandukay, 3500–2400 m (Nov. 14, 1963); Thakma Khola–Yamphodin, 3300–2100 m (Nov. 17, 1963).

Distr. E. Himalaya (Nepal, Sikkim).

Senecio triligulatus Hamilt. ex D. Don, Prodr. Fl. Nepal. 178 (1825).

Bilbatay Bhanjang, 2200 m (Oct. 26, 1963, before fl.); Birwa–Yektin, 2400–1700 m (Nov. 28, 1963).

Distr. E. Himalaya (Nepal to Mishmi), Burma, Thai, and China (Yunnan).

Senecio Wallichii DC., Prodr. **6**: 364 (1838).

Bilbatay Bhanjang, 2200 m (Oct. 26, 1963); Hati Sar–Minchin Dhap, 2700–2800 m (Oct. 28, 1963).

Distr. Himalaya (Nepal to Bhutan).

Siegesbeckia orientalis L., Sp. Pl. ed. 1, 100 (1753).

Dentam–Pamianchi, 1500–2000 m (May 12, 1960); Gangtok, 1600 m (Jun. 15, 1960); Swayambhu Nath, Kathmandu, 1500 m (Sep. 23, 1963); Kathmandu Airport, 1400 m (Oct. 13, 1963); Phusri–Dhara Pani, 450–900 m (Oct. 16, 1963); Dhara Pani–Dhankuta, 900–1200 m (Oct. 17, 1963); Illam–Ranga Pani, 1200–700 m (Dec. 8, 1963); Ranga Pani–Ghorwa, 700–300 m (Dec. 9, 1963).

Distr. sp. Africa, Asia Minor, Caucasus, Iran, Afghanistan, India, Indo-China, China, Japan, Philippines, and Australia.

In China and Japan, *Siegesbeckia orientalis* is represented by three races, namely subsp. *orientalis*, subsp. *glabrescens*, and subsp. *pubescens*.

Subsp. *orientalis* is characterized by rather shorter main stem, stopped by the terminal flower head, while two others have longer main stem lately stopped by the terminal flower head. So the dichotomous branching is apparent in subsp. *orientalis*, and obscure in the two others. Subsp. *pubescens* has villose stem and leaves. Subsp. *orientalis* and subsp. *glabrescens* have pubescent stem and leaves.

The specimens from Nepal show variability in hairiness of stem and leaves. Some specimens look like an intermediate form between subsp. *orientalis* and subsp. *pubescens* as for hairiness.

Sonchus arvensis L., Sp. Pl. ed. 1, 793 (1753).

Butia Basti, Darjeeling, 2000 m (Apr. 6, 1960); Gangtok, 1600 m (Jun. 15, 1960); between Kathmandu and Thankot, 1400–1300 m (Sep. 19, 1963); Chobar Gorge, north of Kathmandu, 1200 m (Sep. 21, 1963); Dhankuta, 1200 m (Oct. 20, 1963); Yektin, 1700 m (Nov. 28, 1963).

var. **laevipes** Koch, Syn. D. u. Schw. Fl. ed. 2, 498 (1844).

Sonchus ulginosus Bieb.

Taplethok-Helok, 1300-1500 m (Nov. 6, 1963); Khebang-Bharomdin, 1700-1000 m (Nov. 24, 1963).

Distr. sp. Semicosmopolitan.

Sonchus asper Hill, Herb. Brit. **1**: 47 (1769).

Gauriganja–Rangali, 200 m (Dec. 13, 1963).

Distr. Cosmopolitan.

Sonchus oleraceus L., Sp. Pl. ed. 1, 174 (1753).

Kathmandu Airport, 1400 m (Oct. 13, 1963).

Distr. Cosmopolitan.

Sphaeranthus indicus L., Sp. Pl. ed. 1, 927 (1753).

Ranga Pani–Ghorwa, 700–300 m (Dec. 9, 1963); Sibganja–Mahara Bahara, 200 m (Dec. 12, 1963); Mahara Bahara–Kathgara, 200 m (Dec. 13, 1963).

Distr. Africa, tropical Himalaya, India, Assam, Malay Islands, and Australia.

Spilanthus Acmella (L.) Murr., Syst. ed 13: 610 (1774).

Verbesina Acmella L., Sp. Pl. ed. 1, 901 (1753).

Illam, 1200 m (Dec. 6, 1963).

Distr. Pantropic.

Spilanthus Pseudo-Acmella (L.) Murr., Syst. ed. 13, 610 (1774).

Verbesina Pseudo-Acmella L., Sp. Pl. ed. 1, 901 (1753).

S. calva DC., Prodr. **5**: 625 (1836).

S. Acmella var. *calva* (DC.) C. B. Clarke, Compos. Ind. 138 (1876).

Takdah, 1600–1700 m (Apr. 19, 1960); Rimbick, 2200 m (May 5, 1960); Godavari, near Kathmandu, 1500 m (Sep. 18, 1963); Dhankuta, 1200 m (Oct. 19, 1963); Dhankuta–Murhay, 2200–2000 m (Oct. 23, 1963); Taplejung–Garhi Danra, 2000–2200 m (Nov. 3, 1963); Tharpu–near Chyangthaphu, 1200–1100 m (Nov. 26, 1963).

Distr. Himalaya, India, and Burma.

Synedrella nodiflora Gaertn., Fruct. et Sem. **2**: 456, t. 171, f. 7 (1791).

Verbesina nodiflora L., Cent. Pl. **1**: 28 (1755); Amoen. Acad. **4**: 290 (1759).

Gangtok, 1650 m (Jun. 13, 1960); Phusri–Dhara Pani, 450–900 m (Oct. 16, 1963); Dhara Pani–Dhankuta, 900–1200 m (Oct. 17, 1963); Illam, 1200 m (Dec. 7, 1963); Ranga Pani–Ghorwa, 700-300 m (Dec. 9, 1963).

Distr. Pantropic; native of America.

Tagetes erecta L., Sp. Pl. ed. 1, 887 (1753).

Taplejung–Garhi Danra, cult., 2000–2200 m (Nov. 3, 1963).

Distr. A garden plant; native of Mexico.

Tagetes patula L., Sp. Pl. ed. 1, 887 (1753).

Dhara Pani–Illam, cult., 1500–1200 m (Dec. 5, 1963).

Distr. A garden plant; native of Mexico.

Tithonia diversifolia (Hemsl.) A. Gray in Proc. Amer. Acad. **19**: 5 (1883).

Mirasoria diversifolia Hemsl., Bibl. Centr. Amer. Bot. **2**: 168 (1881–2); **5**: t. 47 (1879–1888).

Khebang–Bharomdin, 2700–1000 m (Nov. 24, 1963); Tharpu–near Chyangthaphu 1200–1100 m (Nov. 28, 1963); Dhara Pani–Illam 1500–1200 m (Dec. 5, 1963); Illam, 1200 m (Dec. 6, 1963).

Distr. An escaped plant; native of Mexico.

Tridax procumbens L., Sp. Pl. ed. 1, 900 (1753).

Rayang, Darjeeling 250 m (Apr. 23, 1960); Gangtok, 1650 m (Jun. 13, 1960); Phusri–Dhara Pani, 450–900 m (Oct. 16, 1963); Mul Pokhari–Dumhan, 2400–700 m (Oct. 30, 1963); Khebang–Bharomdin, 1700–1000 m (Nov. 24, 1963).

Distr. Pantropic; native of South America.

Vernonia anthelmintica (L.) Willd., Sp. Pl. **3**: 1634 (1804)–DC., Prodr. **5**: 61 (1836).

Conyza anthelmintica L., Sp. Pl. ed. 2, 1207 (1763).

Dhara Pani–Dhankuta, 900–1200 m (Oct. 17, 1963); Dhankuta, 1200 m (Oct. 18 & 19, 1963).

Distr. Afghanistan, Himalaya, and India.

Vernonia cinerea (L.) Lessing in Linnaea **4**: 29 (1829).

Conyza cinerea L., Sp. Pl. ed. 1, 862 (1753).

Gangtok, 1650 m (Jun. 13, 1960); Mahara Bahara–Kathgara, 200 m (Dec. 13, 1963).

Distr. sp. Tropical regions of Africa, Asia, and Australia.

var. **parviflora** (Reinw.) DC., Prodr. **5**: 24 (1836).

V. parviflora Reinwaldt in Blume, Bijdr. 893 (1826).

Rayang, Darjeeling, 250 m (Apr. 23, 1960); Biratnagar, 200 m (Oct. 14, 1963); Phusri–Sanguri Bhanjang–Dhara Pani, 450–900 m (Oct. 16, 1963); Dhara Pani–Dhankuta, 900–1200 m (Oct. 17, 1963); Dhankuta, 1200 m (Oct. 18 & 19, 1963); Dumhan, 700 m (Oct. 31, 1963); Kathgara–Rangali, 200 m (Dec. 14, 1963).

Distr. var. Tropical Asia.

Vernonia squarrosa (D. Don) Less. in Linnaea **6**: 627 (1831); non Less., l.c. 678–Kerr, Fl. Siam. **2**: 244 (1936).

Acilepis squarrosa D. Don, Prodr. Fl. Nepal. 169 (1825).

V. teres Wall. ex DC., Prodr. **5**: 15 (1836).

Dhankuta, 1200 m (Oct. 18, 19 & 20, 1963).

Distr. Tropical Himalaya (Kumaon to Sikkim), India, Burma, Thai, Indo-China, and China.

Vernonia subsessilis DC., Prodr. **5**: 62 (1836).

var. **macrophylla** Hooker f., Fl. Brit. Ind. **3**: 230 (1881).

Bharomdin–Tharpu, 1000–1200 m (Nov. 25, 1963); Tharpu–near Chyangthaphu, 1200–1100 m (Nov. 26, 1963).

Distr. var. E. Himalaya (E. Nepal).

Vernonia volkameriaefolia DC., Prodr. **5**: 132 (1836).

Takdah, 1500 m (Apr. 20, 1960); Garhi Danra–Tuwa, 2200–1800 m (Nov. 4, 1963, before fl.); Taplethok–Helok, 1300–1500 m (Nov. 6, 1963, before fl.); Yetkin–Batasay, 1400-2400 m (Nov. 30, 1963, before fl.).

Distr. Himalaya (Nepal to Bhutan), Khasia, Mishmi Hills, Burma, Thai, and Indo-China.

Vittadenia triloba (Gaudich.) DC., Prodr. **5**: 281 (1836)–Kitamura in Act. Phytotax. Geobot. **20**: 119 (1962).

Brachycome triloba Gaudich., Voy. Frey. Bot. 467 (1826).

V. australis A. Rich., Ess. Fl. Neuv.-Zél. 251 (1832).

Darjeeling, 1900 m (Jun. 21, 1960).

Distr. An escaped plant; native of New Zealand.

Wedelia biflora (L.) DC. in Wight, Contr. 18 (1834).

Verbesina biflora L., Sp. Pl. ed. 2, 1272 (1763).

Pouwa, Kathmandu (Oct. 9, 1963); Tuwa–Taplethok, 1800–1300 m (Nov. 5, 1963); Taplethok–Helok, 1300–1500 m (Nov. 6, 1963).

Distr. Africa, India, Indo-China, Thai, Malaya, Philippines, Java, China, Japan, and Australia.

Youngia japonica (L.) DC., Prodr. **7**: 194 (1838).

Prenanthes japonica L., Mant. Pl. **1**: 107 (1767).

Crepis japonica Benth.

Darjeeling, 2100 m (Apr. 2, 1960); Victoria Fall, 1950 m (Apr. 3, 1960); Butia Basti, 2000 m (Apr. 6, 1960).

Distr. Himalaya, India, Malaya, Thai, Indo-China, China, Korea, and Japan.

Zinnia elegans Jacquin, Coll. **3**: 152 (1789).

Dumhan–Taplejung, cult., 700–2000m (Nov. 1, 1963); Tharpu–near Chyangthaphu, cult., 1200–1100 m (Nov. 26, 1963).

Distr. A garden plant; native of Mexico.

MONOCOTYLEDONEAE

TYPHACEAE (by Hiroshi Hara)

Typha angustifolia L., Sp. Pl. ed. 1, **2**: 971 (1753)–Fl. Males. **4**: 243, f. 1 (1951).

T. javanica Schnizlein ex Rohrb. in Verh. Bot. Ver. Brandenb. **11**: 98 (1869)–Fl. Brit. Ind. **6**: 489 (1893).

Ghorwa–Sanichare, 200 m (Dec. 10, 1963, fr.).

Distr. Subtropical and temperate regions in Eurasia, and N. America.

ALISMATACEAE (by Hiroshi Hara)

Sagittaria guayanensis Humb., Bonpl. et Kunth, Nov. Gen. Sp. **1**: 250 (1816)–Fl. Brit. Ind. **6**: 561 (1893).

subsp. **lappula** (D. Don) Bogin in Mem. N.Y. Bot. Gard. **9**: 192, f. 5 (1955)–Fl. Males. **5**: 328, f. 6 (1957).

Sagittaria lappula D. Don, Prodr. Fl. Nepal. 22 (1825).

Lophotocarpus guyanensis J. G. Smith var. *lappula* (D. Don) Buchenau in Pfl.-reich IV–15, Ht. **16**: 36, f. 12 C (1903).

Biratnagar, 200 m (Oct. 14, 1963, fl. & fr.).

Distr. Tropical Himalaya, India, east to S. China and Formosa, and Malaysia.

BUTOMACEAE (by Hiroshi Hara)

Tenagocharis latifolia (D. Don) Buchenau in Abh. Naturw. Ver. Bremen **2**: 2, 3 & 6 (1868); in Pfl.-reich IV–16, Ht. **16**: 7, f. 3 (1903)–Fl. Males. **5**: 118, f. 1 (1955).

Butomus latifolius D. Don, Prodr. Fl. Nepal. 22 (1825).

Butomus lanceolatus Roxb., Fl. Ind. ed. 2, **2**: 315 (1832).

Butomopsis lanceolata (Roxb.) Kunth, Enum. Pl. **3**: 165 (1841)–Fl. Brit. Ind. **6**: 562 (1893).

Biratnagar, 200 m (Oct. 14, 1963, fl. & fr.); Nissim–Dumhan, 700–1200 m (Oct. 30, 1963, fl.); Dumhan–Taplejung, 800 m (Nov. 1, 1963, fr.); Bharomdin–Tharpu, 700–1200 m (Nov. 25, 1963, fr.); Sibganja–Gauriganja, 200 m (Dec. 12, 1963, fr.); Kathgara–Rangali, 200 m (Dec. 14, 1963, fr.).

Distr. Tropical Africa, tropical Himalaya, India, east to Indo-China and W. China (Yunnan), Malaysia, and N. Australia.

HYDROCHARITACEAE (by Hiroshi Hara)

Blyxa Aubertii Richard in Mém. Inst. Paris **12** (2): 19 & 77, t. 4 (1812)–Fl. Males. **5**: 390, f. 5 (1957).

Diplosiphon oryzetorum Decne. in Jacquem., Voy. 167 (1844).

Blyxa Griffithii Planch. ex Hook. f., Fl. Brit. Ind. **5**: 661 (1888), p.p.

B. muricata Koidzumi in Bot. Mag. Tokyo **31**: 258 (1917).

B. coreana Nakai in Journ. Jap. Bot. **19**: 247 (1943), quoad specim.

Bharomdin–Tharpu, 700–1200 m (Nov. 25, 1963, fr.).

Distr. Madagascar, Himalaya, India, east to Korea and Japan, south to Malaysia, and N. Australia.

GRAMINEAE (by Chien-chang Hsu)

Agrostis gigantea Roth, Fl. Germ. **1**: 31 (1788)–Ohwi in Bot. Mag. Tokyo **55**: 352 (1941)–Bor, Grass. Ind. 387 (1960)–Bor in Dansk Bot. Arkiv **20** (2): 141 (1962).

Darjeeling, 2000 m (Jun. 21, 1960); Ghum–Kurseong, 2200 m (Jun. 22, 1960).

Distr. Europe to temperate Himalaya, Thai, Japan, also introduced to the U.S.A. for meadows, pastures and lawns.

Agrostis inaequiglumis Griseb. in Goett. Nachr. 80 (1868)–Fl. Brit. Ind. **7**: 257 (1896)–Bor, Grass. Ind. 387 (1960)–Ohwi in Journ. Coll. Arts Sci. Chiba **4** (3): 316 (1965).

Jongri, 4200 m (May 21, 1960); Olothang, 3900 m (May 23, 1960).

Distr. E. Himalaya (Nepal, Sikkim).

This is an endemic species commonly found in elevations higher than 3500 m in Sikkim.

Agrostis micrantha Steud., Syn. Pl. Glum. **1**: 170 (1854)–Fl. Brit. Ind. **7**: 256 (1896)–Bor, Grass. Ind. 388 (1960).

Selap–Walunchung Gola, 2600–3500 m (Nov. 10, 1963).

Distr. E. Himalaya (Nepal, Sikkim), Assam, and Burma.

This is a common alpine grass, differing from *A. canina* in its minute anthers up to 0.6 mm long.

Agrostis myriantha Hook. f., Fl. Brit. Ind. **7**: 257 (1896)–Keng, Fl. Ill. Pl. Prim. Sinic. 541 (1959)–Bor, Grass. Ind. 388 (1960)–Ohwi, l.c. **4**: 316 (1965).

Birch Hill, Darjeeling, 2000 m (Jun. 18, 1960).

Distr. E. Himalaya (Nepal, Sikkim), Assam, and China (Yunnan, Kwangsi, Szechuan, Shikang, Hupeh); common in wood.

Agrostis pilosula Trin. in Mém. Acad. Sci. Pétersb. sér. 6, **6** (2): 372 (1841)–Fl. Brit. Ind. **7**: 263 (1896)–Bor, Grass. Ind. 388 (1960)–Ohwi, l.c. **4**: 316 (1965).

Calamagrostis pilosula (Trin.) Hook. f., Fl. Brit. Ind. **7**: 263 (1896).

Dhankuta–Sinduwa, 1200 m–2100 m (Oct. 22, 1963); Sinduwa, 2100 m (Oct. 23 & 24, 1963); Murhay–Bilbatay Bhanjang, 2000–2200 m (Oct. 24, 1963); Hati Sar–Minchin Dhap, 2700–2800 m (Oct. 28, 1963); Minchin Dhap–Mul Pokhari, 2800–2400 m (Oct. 29, 1963); Baroya Khimty–Thakma Khola, 3100 m (Nov. 12, 1963); Helok–Baroya Khimty, 1500–2500 m (Nov. 15, 1963); Batasay–Bhuspate Danra, 2400–2900 m (Dec. 1, 1963).

Distr. E. Himalaya (Nepal, Sikkim), and North-west India.

A variable grass with hairy lemma and minute palea.

Agrostis Zenkeri Trin. in Mém. Acad. Sci. Pétersb. sér. 6, **6**, (2): 363 (1841)–Bor, Grass. Ind. 392 (1960).

Deyeuxia abnormis Hook. f., Fl. Brit. Ind. **7**: 268 (1896).

Phusri–Dhara Pani, 450–900 m (Oct. 16, 1963); Dhankuta, 1200 m (Oct. 19, 1963); Zongri–Iladanda, 2600–1800 m (Nov. 12, 1963); Mahara Bahara–Kathgara, 2000 m

(Dec. 13, 1963).

Distr. E. Himalaya (Nepal, Sikkim), and Assam.

Anthoxanthum odoratum L., Sp. Pl. ed. 1, 28 (1753)–Fl. Brit. Ind. **7**: 222 (1896)–Ohwi in Journ. Jap. Bot. **17**: 492 (1941)–Keng, Fl. Ill. Pl. Prim. Sinic. 264 (1959)–Bor, Grass. Ind. 431 (1960).

Darjeeling, 2000 m (Apr. 14, 1960).

Distr. Europe to Siberia, naturalized in India, temperate Himalaya, China (Lu-shan), and Japan.

Apluda mutica L., Sp. Pl. ed. 1, 82 (1753)–Ohwi in Act. Phytotax. Geobot. **11**: 176 (1942)–Reeder in Journ. Arn. Arb. **29**: 348 (1948)–Bor, Grass. Ind. 93 (1960)–Bor in Dansk Bot. Arkiv **20** (2): 166 (1962).

Apluda varia Hack. in DC., Monogr. Phan. 196 (1889)–Fl. Brit. Ind. **7**: 150 (1896).

Rayang, 250 m (Apr. 22, 1960); Dumhan–Taplejung, 700–2000 m (Nov. 1, 1963); Tuwa–Taplethok, 1800–1300 m (Nov. 5, 1963); Tharpu–near Chyangthaphu, 1200–1100 m (Nov. 26, 1963); Ghorwa–Sanichare, 300–200 m (Dec. 10, 1963).

Distr. E. Himalaya (Nepal, Sikkim), Assam, India, Thai, S. China, Formosa, Ryukyu, Philippines, and as far as Australia.

The original description of Linnaeus in 1753 had two states concerned on the characteristic of awn in lower lemma of the sessile spikelet, namely awned and awnless, later on he put the awned one in *A. aristata* L. (Amoen. Acad. **4**: 303, 1756). For solving the confusion, Hackel gave the plant a new name, *A. varia* (in DC., Monogr. Phan. **6**: 196, 1889) of which he divided to subspecies, i.e. subsp. *aristata* and subsp. *mutica*. Several varieties or subvarieties were set down under both subspecies. But the awn of the sessile spikelets varies even in the same inflorescence and there are numerous intermediates.

Arthraxon lanceolatus (Roxb.) Hochst. in Flora **39**: 188 (1856)–Fl. Brit. Ind. **7**: 143 (1896)–Ohwi in Act. Phytotax. Geobot. **11**: 163 (1942)–Keng, Fl. Ill. Pl. Prim. Sinic. 812 (1959)–Bor, Grass. Ind. 100 (1960).

Andropogon lanceolatus Roxb., Fl. Ind. ed. Carey, **1**: 262 (1820).

Dumhan–Taplejung, 700–2000 m (Nov. 1, 1963); Khebang–Bharomdin, 1700–1000 m (Nov. 24, 1963).

Distr. Abyssinia, temperate regions of Himalaya, Indo-China, and China.

Arthraxon lancifolius (Trin.) Hochst. in Flora **39**: 188 (1856)–Bor, Grass. Ind. 100 (1960)–Bor in Dansk Bot. Arkiv **20** (2): 167 (1962)–Bor, l.c. **23** (2): 156 (1965).

Andropogon lancifolius Trin. in Mém. Acad. Sci. Pétersb. sér. 6, **2**: 271 (1832).

Arthraxon microphyllus (Trin.) Hochst. l.c. **39**: 188 (1856)–Fl. Brit. Ind. **7**: 147 (1896)–Keng, Fl. Ill. Pl. Prim. Sinic., 812 (1959).

Kathmandu Airport, 1400 m (Oct. 13, 1963); Khebang, 1700 m (Nov. 23, 1963).

Distr. Temperate Himalaya, Ceylon to Burma, Thai, China (Yunnan), Malaysia, and tropical Africa.

Arthraxon micans (Nees) Hochst. in Flora **39**: 188 (1856)–Bor, Grass. Ind. 101 (1960).

Bathratherum micans Nees in Edinb. New Philos. Journ. **18**: 182 (1835).

Dhankuta, 1200 m (Oct. 19, 1963).

Distr. Himalaya (Nepal), and north-west India.

Arthraxon quartinianus (A. Rich.) Nash in N. Amer. Flora **17**: 99 (1912)–Jansen in Reinwardtia **2** (2): 231 (1953)–Bor, Grass. Ind. 102 (1960).

Alectoridia quartiniana A. Rich., Tent. Fl. Abyss. **2**: 448, t. 99 (1851).

Arthraxon ciliaris P. Beauv. subsp. *quartinianus* (Rich.) Hack., Andropog. in DC., Monogr. Phan. **6**: 356 (1889).

Arthraxon Okamotoi Ohwi in Act. Phytotax. Geobot. **11**: 165 (1942).

Kathmandu, 1400 m (Sept. 17, 1963); Phusri–Dhara Pani, 450–900 m (Oct. 16, 1963); Nissim–Dumhan, 1500–700 m (Oct. 30, 1963); Dumhan, Taplejung Dist., by the Tamur River, 700 m (Oct., 31, 1963); Tharpu, 1200 m (Nov. 26, 1963); Illam, 1200 m (Dec. 7, 1963).

Distr. Abyssinia, and penisular India, found also from Sumatra, Java, Celebes, Philippines, and Formosa.

External feature resembles *A. hispidus*, but differs from it by ciliated rachis-joints and much larger (5 mm long) spikelets. In this species, joints are much reduced (1.7–2 mm long) and pedicels which are merely a minute point. *A. Okamotoi* was reported by Ohwi, from the southern part of Formosa, Chi-Shan, as a new species, but there is no difference between it and *A. quartinianus.*

Arthraxon sikkimensis Bor in Kew Bull. **1951**: 447 (1952)–Bor, Grass. Ind. 102 (1960).

Bilbatay Bhanjang–Hati Sar, 2200–2700 m (Oct. 27, 1963); Minchin Dhap–Mul Pokhari, near Taplejung, 2800–2400 m (Oct. 29, 1963); Taplejung–Garhi Danra 2000–2200 m (Nov. 3, 1963); Baroya Khimty–Thakma Khola, 2500–3100 m (Nov. 12, 1963).

Distr. E. Himalaya (Nepal, Sikkim), and Naga Hills.

Arundinella bengalensis (Spreng.) Druce in Rep. Bot. Exch. Cl. Brit. Isles, 605 (1916)–Keng, Fl. Ill. Pl. Prim. Sinic. 627 (1959)–Bor, Grass. Ind. 421 (1960)–Bor in Dansk Bot. Arkiv **20** (2): 142 (1962).

Panicum bengalensis Spreng., Syst. Veg. **1**: 311 (1825).

Ranga Pani–Ghorwa, 700–300 m (Dec. 9, 1963).

Distr. E. Himalaya (Nepal), Assam, India, Burma, Thai, Indo-China to W. China (Yunnan, Szechuan, Kwangsi).

Arundinella birmanica Hook. f., Fl. Brit. Ind. **7**: 73 (1896)–Bor, Grass. Ind. 421 (1960).

Above Lelep, 2600m (Nov. 9,1 963); below Siling Tzokupa, 2100m (Nov. 21, 1963).

Distr. E. Himalaya (Nepal), and Burma.

Perhaps this species is closely related to the perennial species, *A. Chenii* Keng of W. China, which was found in Yunnan, Szechuan and Sikang.

Arundinella nepalensis Trin., Gram. Panic. 62 (1826)–Keng, Fl. Ill. Pl. Pl. Prim. Sinic. 726 (1959)–Bor, Grass. Ind. 423 (1960)–Bor in Dansk Bot. Arkiv **20** (2): 142 (1962)–Ohwi in Journ. Coll. Arts Sci. Chiba **4**: 316 (1965).

Takdah, 1600–1700 m (Apr. 19, 1960); Phusri–Dhara Pani, 450–900 m (Oct. 16, 1963); Dhankuta, 1200 m (Oct. 19, 1963); Sinduwa, Dhankuta Dist., 2100 m (Oct. 24, 1963); Dumhan, 700 m (Oct. 30, 1963); Dumhan–Taplejung, 700–2000 m (Nov. 1, 1963); Tuwa–Taplethok, 1800–1300m (Nov. 5, 1963); Baroya Khimty–Thakma Khola, 2500–3100 m (Nov. 12, 1963); below Siling Tzokupa–Khebang, 2100–1700 m

(Nov. 22, 1963); Khebang-Bharomdin, 1700–1000 m (Nov. 24, 1963); Tharpu-near Chyangthaphu, 1200–1100 m (Nov. 26, 1963); Dhara Pani-Illam, 1500–1200 m (Dec. 5, 1963).

Distr. Widely distributed in E. Himalaya (Nepal, Sikkim), Assam, India, Thai, Indo-China to W. China (Yunnan, Kwangtung, Kwangsi, Hainan).

Arundinella setosa Trin., Gram. Panic. 63 (1826)–Ohwi in Act. Phytotax. Geobot. **10**: 272 (1941)–Jansen in Reinwardtia **2** (2): 234 (1953)–Keng, Fl. Ill. Pl. Prim. Sinic. 732 (1959)–Bor, Grass. Ind. 424 (1960)–Bor in Dansk Bot. Arkiv **20** (2): 143 (1962)–Bor, l.c. **23** (2): 144 (1965).

Arundinella capillaris Hook. f., Fl. Brit. Ind. **7**: 64 (1896).

Helok-Baroya Khimty, 1500–2500 m (Nov. 10, 1963); Baroya Khimty-Thakma Khola, 2500–3100 m (Nov. 12, 1963).

Distr. Widely distributed in E. Himalaya (Nepal), Assam, India, Thai, Indo-China, China, Formosa, Philippines, and New Guinea.

This is a variable species. It may be medium to robust in habit and the hairiness of the leaves together with its size of the spikelets varies in a wide range. The Formosan specimens are characterized by smaller spikelets and thinner but woody culms.

Arundo Donax L., Sp. Pl. ed. 1, 81 (1753)–Fl. Brit. Ind. **7**: 302 (1896)–Ohwi in Act. Phytotax. Geobot. **10**: 265 (1941)–Keng, Fl. Ill. Pl. Prim. Sinic. 335 (1959)–Bor, Grass. Ind. 413, f. 44 (1960)–Bor in Dansk Bot. Arkiv **20** (2): 142 (1962).

Sinduwa, Dhankuta Dist., 2100 m (Oct. 23, 1963).

Distr. Widely distributed in Tropical Asia, and Mediterranean Region.

Axonopus compressus (Sw.) P. Beauv., Ess. Agrost. 12, 154, 167 (1812)–Ohwi in Act. Phytotax. Geobot. **11**: 42 (1942)–Keng, Fl. Ill. Pl. Prim. Sinic. 683 (1959)–Bor, Grass. Ind. 278 (1960)–Bor in Dansk Bot. Arkiv **20** (2): 154 (1962)–Ohwi in Bull. Nat. Sci. Mus. **6**: 120 (1962)–Hsu in Taiwania no. **9**: 38 (1963)–Bor, l.c. **23** (2): 150 (1965).

Peshok, 900 m (Apr. 27, 1960); Tuwa-Taplethok, 1800–1300 m (Nov. 5, 1963).

Distr. Introduced from the New World, now naturalized in E. Himalaya, India, China (Kwangtung, Hainan), and Formosa.

This species has been introduced into southern Formosa (Tainan) where it has become naturalized.

Bothriochloa intermedia (R. Br.) A. Camus in Ann. Soc. Linn. Lyon, n.s. **76**: 164 (1931)–Keng, Fl. Ill. Pl. Prim. Sinic. 823 (1959)–Bor, Grass. Ind. 108 (1960)–Bor in Dansk Bot. Arkiv **20** (2): 167 (1962).

Andropogon intermedius R. Br., Prodr. 202 (1810)–Fl. Brit. Ind. **7**: 175 (1896)–Reeder in Journ. Arn. Arb. **29**: 367 (1948).

Andropogon glaber Roxb., Fl. Ind. ed. Carey, **1**: 271 (1820).

Bothriochloa glabra (Roxb.) A. Camus, l.c. **76**: 164 (1931)–Ohwi in Act. Phytotax. Geobot. **11**: 167 (1942).

Kalimpong, 1300 m (Jun. 19, 1960); Sibganja-Mahara Bahara, 200 m (Dec. 12, 1963).

Distr. Tropical Asia to Australia, including the Pacific Islands.

This is a coarse grass commonly found in low altitudes and in plains.

var. **punctata** (Roxb.) Keng, Clav. Gram. Prim. Sinic. 244 (1957) et Fl. Ill. Pl. Prim. Sinic. 823 (1959)-Bor, Grass. Ind. 108 (1960).

Andropogon punctatus Roxb., Fl. Ind. ed. Carey, **1**: 268 (1820).

Kathmandu Airport, 1400 m (Oct. 13, 1963); Dhankuta, 1200 m (Oct. 19, 1963); Dumhan-Taplejung, 700-2000 m (Nov. 1, 1963).

Distr. India, China (Yunnan, Szechuen, Fokien), Formosa, and tropical Africa.

Differs from the species in having taller, up to 130 cm high culms. The panicles are 15 cm long with 2-5 racemes at the basal branches. The lower glume bears a pore at their backside and the lemmas are slightly shorter than the lower glumes.

Bothriochloa Ischaemum (L.) Keng in Contr. Biol. Lab. Sci. Soc. China, Bot. Ser. **10**: 201 (1936)-Ohwi in Act. Phytotax. Geobot. **11**: 168 (1942)-Keng, Fl. Ill. Pl. Prim. Sinic. 825 (1959)-Bor, Grass. Ind. 108 (1960).

Andropogon Ischaemum L., Sp. Pl. ed. 1, 1047 (1753)-Fl. Brit. Ind. **7**: 171 (1896).

Dhara Pani-Dhankuta, 900-1200 m (Oct. 17, 1963); Kathgara-Rangali, 200 m (Dec. 14, 1963).

Distr. North-west Himalaya, India, Tibet, southern China, and Formosa. Also found in southern Europe and North Africa.

The main axis of the inflorescence is contracted in digitate-form and is shorter than the lower racemes. The lower glume of the sessile spikelet is woolly haired.

Bothriochloa pertusa (L.) A. Camus in Ann. Soc. Linn. Lyon, n.s. **76**: 164 (1931)-Bor, Grass. Ind. 109 (1960).

Holcus pertusus L., Mant. Pl. **2**: 301 (1771).

Andropogon pertusus (L.) Willd., Sp. Pl. **4**: 922 (1806)-Fl. Brit. Ind. **7**: 173 (1896).

Sinduwa, Dhankuta Dist., 2100 m (Oct. 24, 1963).

Distr. Arabia to South-east Asia, and Tropical Africa.

Brachiaria ramosa (L.) Stapf in Prain, Fl. Trop. Afr. **9**: 542 (1919)-Keng, Fl. Ill. Pl. Prim. Sinic. 675 (1959)-Bor, Grass. Ind. 284 (1960)-Bor in Dansk Bot. Arkiv **20** (2): 155 (1962)-Ohwi in Journ. Coll. Arts Sci. Chiba **4**: 316 (1965).

Panicum ramosum L., Mant. Pl. **1**: 29 (1767)-Fl. Brit. Ind. **7**: 36 (1896).

Gangtok, 1650 m (Jun. 13, 1960); Siliguri, 200 m (Jun. 29, 1960).

Distr. Africa, E. Himalaya (Sikkim), India, Thai, Malaysia, and China (Hainan).

Brachiaria subquadripara (Trin.) Hitchc. in Lingnan Sci. Journ. **7**: 214 (1931)-Reeder in Journ. Arn. Arb. **29**: 273 (1948)-Jansen in Reinwardtia **2** (2): 238 (1953)-Keng, Fl. Ill. Pl. Prim. Sinic. 675 (1959)-Bor, Grass. Ind. 286 (1960)-Bor in Dansk Bot. Arkiv **20** (2): 156 (1962)-Hsu in Taiwania no. **9**: 39 (1963)-Bor, l.c. **23** (2): 150 (1965).

Panicum subquadriparum Trin., Gram. Panic, 145 (1826).

Brachiaria distachya auct. sensu Ohwi in Act. Phytotax. Geobot. **11**: 44 (1942).

Biratnagar, 200 m (Oct. 14, 1963); Phusri-Dhara Pani, 450-900 m (Oct. 16, 1963); Dumhan, Taplejung Dist., by the Tamur River, 700 m (Oct. 30, 1963); Ghorwa-Sanichare, 300-200 m (Dec. 10, 1963); Sanichare-Sibganja, 200 m (Dec. 11, 1963); Sibganja-Mahara Bahare, 200 m (Dec. 12, 1963).

Distr. E. Himalaya (Sikkim), India, Thai, S. China (Hainan, Kwangtung, Kwangsi, Fokien), Formosa, Ryukyu, Micronesia, Malaysia, and Australia.

Brachiaria villosa (Lamk.) A. Camus in Fl. Gén. Indo-Chin. **7**: 433 (1922)-Ohwi in Act. Phytotax. Geobot. **11**: 43 (1942)-Jansen in Reinwardtia **2** (2): 235 (1953)-Keng, Fl. Ill. Pl. Prim. Sinic. 676 (1959)-Bor, Grass. Ind. 286 (1960)-Hsu in Taiwania no. **9**: 39 (1963)-Ohwi, l.c. **4**: 316 (1965).

Panicum villosum Lamk., Tab. Encycl. **1**: 173 (1791), p.p.-Fl. Brit. Ind. **7**: 34 (1896).

Brachiaria coccosperma (Steud.) Stapf ex Backer, Handb. Fl. Java Afl. **2**: 147 (1928)-Reeder in Journ. Arn. Arb. **29**: 273 (1948).

Rangpo-Tista Bazar, 350-300 m (Jun. 13, 1960); Kathmandu Airport, 1400 m (Oct. 13, 1963); Dhara Pani-Dhankuta, 900-1200 m (Oct. 17, 1963).

Distr. E. Himalaya (Nepal Sikkim), Assam, India, Indo-China, S. China, Formosa, Ryukyu, S. Japan, and Philippines.

Brachypodium sylvaticum (Huds.) P. Beauv., Ess. Agrost. 101, 155 (1812)-Fl. Brit. Ind. **7**: 362 (1896)-Ohwi in Act. Phytotax. Geobot. **10**: 95 (1941)-Jansen in Reinwardtia **2** (2): 241 (1953)-Keng, Fl. Ill. Pl. Prim. Sinic. 279 (1959)-Bor, Grass. Ind. 450 (1960).

Zongi-Iladanda, 2600-1800 m (Nov. 12, 1963); Bharoya Khimty-Thakma Khola, Taplejung Dist., 2500-3300 m (Nov. 16, 1963).

Distr. Europe and temperate parts of Asia, including the mountains of tropical regions.

A glabrous form found in mountainous regions of Formosa, Philippines, Sumatra, Java, Celebes and New Guinea was separated as var. *luzoniense* (Hack.) Hara in Bot. Mag. Tokyo **52**: 227 (1938), based on *B. sylvaticum* subsp. *luzoniense* Hack. (in Philip. Journ. Sci. **1**, Suppl. 269, 1906).

Bromus himalaicus Stapf apud Hook. f., Fl. Brit. Ind. **7**: 358 (1896)-Bor, Grass. Ind. 454 (1960).

Sandakphu-Gatribas, 3200 m (Sep. 17, 1963).

Distr. E. Himalaya.

Bromus ramosus Huds., Fl. Angl. 40 (1762)-Bor, Grass. Ind. 456 (1960).

Baroya Khimty-Thakma Khola, 2500-3300 m (Nov. 16, 1963); Thakma Khola-Yamphodin, 3300-2100 m (Nov. 17, 1963).

Distr. Europe and temperate regions of western and central Asia.

Calamagrostis emodensis Griseb. in Goett. Nachr. 80 (1868)-Fl. Brit. Ind. **7**: 261 (1896)-Keng, Fl. Ill. Pl. Prim. Sinic. 526 (1959)-Bor, Grass. Ind. 395 (1960).

Baroya Khimty-Thakma Khola, 2500-3300 m (Nov. 12 & 16, 1963); below Siling Tzokupa-Siling Tzokupa, 2100-3800 m (Nov. 21, 1963).

Distr. Himalaya (Kashmir, Nepal, Sikkim, Bhutan) and W. China (Yunnan, Szechuan).

Capillipedium assimile (Steud.) A. Camus in Fl. Gén. Indo-Chin. **7**: 314 (1922)-Henr. in Blumea **3** (3): 460-2 (1940)-Jansen in Reinwardtia **2** (2): 251 (1953)-Bor, Grass. Ind. 110 (1960)-Bor in Dansk Bot. Arkiv **20** (2): 168 (1962).

Andropogon assimilis Steud. in Zoll., Syst. Verz. 58 (1854) et in Syn. Pl. Glum. **1**: 397 (1854)-Fl. Brit. Ind. **7**: 179 (1896).

Andropogon glaucopsis Steud., l.c. **1**: 397 (1854).

Capillipedium glaucopsis (Steud.) Stapf in Hook., Icon. Pl. sub tab. 3085 (1922)-Keng, Fl. Ill. Pl. Prim. Sinic. 827 (1959).

Bothriochloa picta Ohwi in Act. Phytotax. Geobot. **11**: 167 (1942).

Rimbick, 2200 m (May 5, 1960); Rimbick–Ramam, 1900–2400 m (May 7, 1960); Dentam–Pamianchi, 1500–2000 m (May 12, 1960); Pouwa–Kathmandu, 1400–1600 m (Oct. 9, 1963); Phusri–Dhara Pani, 450–900 m (Oct. 16, 1963); Dhara Pani–Tamur Bridge, 900–300 m (Oct. 17, 1963); Dhankuta, 1200 m (Oct. 20, 1963); Sinduwa, Dhankuta Dist., 2100 m (Oct. 23, 1963); Dumhan, Taplejung Dist., by the Tamur River, 700 m (Oct. 31. 1963); Khebang–Bharomdin, 1700–1000 m (Nov. 24, 1963); Bharomdin–Tharpu, 1000–1200 m (Nov. 25, 1963); Dhara Pani–Illam, 1500–1200 m (Dec. 5, 1963).

Distr. E. Himalaya, India, Thai, Indo-China, S. China, Formosa, and Malaysia.

This species has been much confused with *C. parviflorum*. It is common in mountainous regions throughout the Island of Formosa, especially on rocky open places near streams. The culms are bamboo-like and with a creeping woody rhizome. Its branches are ascending. The leaves are linear-lanceolate and usually somewhat farinose. Ohwi reported *Bothriochloa picta* from Formosa and Kwangtung, but after reinvestigating the materials and comparing with the present specimens, it is confirmed that Ohwi's species is identical with *C. assimile*.

Capillipedium parviflorum (R. Br.) Stapf in Prain, Fl. Trop. Afr. **9**: 169 (1917)–Jansen in Reinwardtia **2** (2): 246 (1953)–Keng, Fl. Ill. Pl. Prim. Sinic. 827 (1959)–Bor, Grass. Ind. 112 (1960).

Holcus parviflorus R. Br., Prodr. 199 (1810).

Andropogon micranthus Kunth, Rev. Gram. **1**: 165 (1829)–Fl. Brit. Ind. **7**: 178 (1896).

Bothriochloa parviflora (R. Br.) Ohwi in Act. Phytotax. Geobot. **11**: 166 (1942).

Pauwa–Kathmandu, 1400–1600 m (Oct. 9, 1963); Dhara Pani–Dhankuta, 900–1200 m (Oct. 17, 1963); Tuwa–Taplethok, 1800–1300 m (Nov. 5, 1963); Bharomdin–Tharpu, 1000–1200 m (Nov. 25, 1963).

Distr. Himalaya (Kashmir, Nepal), Assam, India, Malaysia to Japan, Australia, Polynesia, and westwards to Abyssinia.

This is a very common species found in plains throughout the Island of Formosa. The culms are tufted, forming a large stand here and there. It has a well developed root-system and is hard to remove even a single culm.

Centotheca lappacea (L.) Desv. in Nouv. Bull. Soc. Philom. **2**: 189 (1810)–Fl. Brit. Ind. **7**: 332 (1896)–Bor, Grass. Ind. 457, f. 50 (1960)–Bor in Dansk Bot. Arkiv **20** (2): 143 (1962)–Ohwi in Bull. Nat. Sci. Mus. **6**: 120 (1962)–Bor, l.c. **23** (2): 144 (1965).

Cenchrus lappaceus L., Sp. Pl. ed. 2, 1488 (1763).

Ranga Pani–Ghorwa, 700–300 m (Dec. 9, 1963); Ghorwa–Sanichare, 300–200 m (Dec. 10, 1963).

Distr. Widely distributed in E. Himalaya (Nepal), Assam, India, Ceylon, Thai, Malay, S. China, Formosa, Polynesia, and tropical Africa.

Chrysopogon aciculatus (Retz.) Trin., Fund. Agrost. 188 (1820)–Ohwi in Act. Phytotax. Geobot. **11**: 162 (1942)–Reeder in Journ. Arn. Arb. **29**: 359 (1948)–Keng, Fl. Ill. Pl. Prim. Sinic. 820 (1959)–Bor, Grass. Ind. 115 (1960)–Bor in Dansk Bot. Arkiv **20** (2): 168 (1962).

Andropogon aciculatus Retz., Obs. Bot. **5**: 22 (1789)–Fl. Brit. Ind. **7**: 188 (1896).

Rayang, 250 m (Apr. 23, 1960); Gangtok, 1600 m (Jun. 17, 1960); Tista, 300 m (Jun. 20, 1960); Kathmandu Airport, 1400 m (Oct. 13, 1963).

Distr. E. Himalaya (Nepal, Sikkim), India, Burma, Indo-China, Malaysia, China, Formosa, Ryukyu, Polynesia, and N. Australia.

This is one of the most common weeds found in Formosa. It grows in the plains, extremely distributed on roadsides, stream bank and town allotments. The ripen fruits are troublesome to man and suffer severely on animals due to the sharp basal callus. But it plays an important part on water and soil conservation, especially on dry open fields along streams.

Chrysopogon Gryllus (L.) Trin., Fund. Agrost. 188 (1820)–Bor, Grass. Ind. 117 (1960).

Andropogon Gryllus L., Cent. Pl. **2**: 33 (1756)–Fl. Brit. Ind. **7**: 187 (1896).

Mul Pokhari–Dumhan, 2400–700 m (Oct. 30, 1963); Dumhan, Taplejung Dist., 800 m (Oct. 31, 1963); Garhi Danra–Tuwa, 2200–1800 m (Nov. 4, 1963); Khebang, 1400 m (Nov. 23, 1963).

Distr. Temperate Himalaya to S. Europe, and N. Africa, Australia.

Chrysopogon serrulatus Trin. in Mém. Acad. Sci. Pétersb. sér. 6, **2**: 318 (1832)–Bor, Grass. Ind. 118 (1960).

Andropogon monticola Schult. var. *Trinii* Hook. f., Fl. Brit. Ind. **7**: 193 (1896).

Dhara Pani–Dhankuta, 900–1200 m (Oct. 17, 1963); Dhankuta, 1200 m (Oct. 21, 1963).

Distr. Himalaya (Kashmir, Nepal), and North-west India.

Coelachne simpliciuscula (Wight et Arn.) Munro ex Benth. in Journ. Linn. Soc. **19**: 93 (1881)–Bor, Grass. Ind. 576, f. 61 (1960)–Bor in Dansk Bot. Arkiv **20** (2): 149 (1962).

Panicum simpliciusculum Wight et Arn. ex Steud., Syn. Pl. Glum. **1**: 96 (1854).

Coelachne pulchella sensu Hook. f., Fl. Brit. Ind. **7**: 270 (1896).

Gangtok, 1650 m (Jun. 18, 1960); Nissim–Dumhan, 1500–700 m (Oct. 30, 1963).

Distr. Southeast Asia, China and Madagascar.

Coelorhachis striata (Nees ex Steud.) A. Camus in Ann. Soc. Linn. Lyon, n.s. **68**: 197 (1921)–Bor, Grass. Ind. 121 (1960)–Bor in Dansk Bot. Arkiv **20** (2): 169 (1962).

Rottboellia striata Nees ex Steud., Syn. Pl. Glum. **1**: 361 (1854)–Fl. Brit. Ind. **7**: 157 (1896).

Ranga Pani–Ghorwa, 700–300 m (Dec. 9, 1963).

Distr. E. Himalaya (Nepal), Assam, India, Burma, Thai, and South-east Asia.

Coix Lacryma-Jobi L., Sp. Pl. ed. 1, 972 (1753)–Fl. Brit. Ind. **7**: 100 (1896)–Ohwi in Act. Phytotax. Geobot. **11**: 179 (1942)–Reeder in Journ. Arn. Arb. **29**: 378 (1948)–Keng, Fl. Ill. Pl. Prim. Sinic. 851 (1959)–Bor, Grass. Ind. 264 (1960)–Bor in Dansk Bot. Arkiv **20** (2): 177 (1962).

Kathgara–Rangali, 200 m (Dec. 14, 1963).

Distr. Tropical Asia, widely naturalized and cultivated throughout the world.

These specimens are aquatic in habit, bearing soft but long stolons.

Cymbopogon microtheca (Hook. f.) A. Camus in Rev. Bot. Appl. **1**: 284 (1921)–Bor, Grass. Ind. 129 (1960).

Andropogon microtheca Hook. f., Fl. Brit. Ind. **7**: 208 (1896).

Dhara Pani, 450–900 m (Oct. 16, 1963); Tharpu, 1200 m (Nov. 26, 1963); Dhara Pani–Illam, 1500–1200 m (Dec. 5, 1963).

Distr. E. Himalaya (Nepal, Sikkim) and Bihar.

Cymbopogon pendulus (Nees ex Steud.) Wats. in Atkins., Gaz. N. W. Prov. Ind., 392 (1882)–Bor, Grass. Ind. 131 (1960).

Andropogon pendulus Nees ex Steud., Syn. Pl. Glum. **1**: 388 (1854).

Gokarna Forest, northwest of Kathmandu, 1500 m (Sept. 22, 1963); Illam–Ranga Pani, 1200–700 m (Dec. 8, 1963); Ranga Pani–Ghorwa, 700–300 m (Dec. 9, 1963); Khebang–Bharomdin (Nov. 24, 1963).

Dist. E. Himalaya (Nepal), and North-eastern India.

Cymbopogon × **Stracheyi** (Hook. f.) Raizada et Jain in Ind. Forester. **80**: 44 (1954)–Bor, Grass. Ind. 131 (1960).

Andropogon nardus var. *Stracheyi* Hook, f., Fl. Brit. Ind. **7**: 207 (1896).

Below Siling Tzokupa–Siling Tzokupa, 2100–3800 m (Nov. 21, 1963); Khebang, 1400 m (Nov. 23, 1963).

Distr. E. Himalaya (Nepal), and Northwest Himalaya.

Cynodon Dactylon (L.) Pers., Syn. Pl. **1**: 85 (1805)–Fl. Brit. Ind. **7**: 278 (1896)–Ohwi in Act. Phytotax. Geobot. **11**: 264 (1941)–Keng, Fl. Ill. Pl. Prim. Sinic. 472 (1959)–Bor, Grass. Ind. 469, f. 52 (1960)–Bor in Dansk Bot. Arkiv **20** (2): 144 (1962)–Bor, l.c. **23** (2): 144 (1965)–Ohwi in Journ. Coll. Arts Sci. Chiba **4**: 317 (1965).

Panicum Dactylon L., Sp. Pl. ed. 1, 58 (1753).

Peshok, 900 m (Apr. 27, 1960); Ranga Pani–Ghorwa, 700–300 m (Dec. 9, 1963); Kathgara–Rangali, 200 m (Dec. 14, 1963).

Distr. Commonly distributed in all warm countries.

Cyrtococcum accrescens (Trin.) Stapf in Hook., Icon. Pl. sub tab. 3096 (1922)–Jansen in Reinwardtia **2** (2): 257 (1953)–Bor, Grass. Ind. 291 (1960)–Bor in Dansk Bot. Arkiv **20** (2): 156 (1962)–Hsu in Taiwania no. **9**: 40 (1963)–Bor, l.c. **23** (2): 150 (1965).

Panicum accrescens Trin., Sp. Gram. Ic. **1**: t. 88 (1828)–Fl. Brit. Ind. **7**: 57 (1896).

Cyrtococcum patens var. *latifolium* (Honda) Ohwi in Act. Phytotax. Geobot. **11**: 47 (1942).

Pouwa–Kathmandu, 1400–1600 m (Oct. 9, 1963); Dhankuta, 1200 m (Oct. 19, 1963); Nissim, 1500 m (Oct. 30, 1963); Dumhan, Taplejung Dist., by the Tamur River, 700 m (Oct. 31, 1963); Dhara Pani–Illam, 1500–1200 m (Dec. 5, 1963).

Distr. E. Himalaya (Nepal), Assam, India, Indo-China, S. China, Formosa, Ryukyu, Pacific Islands, and Malaysia.

Dactyloctenium aegyptium (L.) P. Beauv., Ess. Agrost. Expl. Pl. 15 (1812)–Keng, Fl. Ill. Pl. Prim. Sinic. 458 (1959)–Bor, Grass. Ind. 489, f. 54 (1960)–Bor in Dansk Bot. Arkiv **20** (2): 145 (1962)–Bor, l.c. **23** (2): 145 (1965)–Ohwi in Journ. Coll. Arts Sci. Chiba **4**: 317 (1965).

Cynosurus aegyptius L., Sp. Pl. ed. 1, 72 (1753).

Eleusine aegyptica (L.) Desf., Fl. Atlant. **1**: 85 (1798)–Fl. Brit. Ind. **7**: 295 (1896).

Dhara Pani–Tamur Bridge, 900–1200 m (Oct. 17, 1963).

Distr. Tropical regions of the Old World.

Danthonia Schneideri Pilger in Fedde, Rep. **17**: 131 (1921)–Hitchc. in Brittonia **2**: 115 (1936)–Jansen in Reinwardtia **2** (2): 258 (1953)–Keng, Fl. Ill. Pl. Prim. Sinic. 498 (1959).

Bilbatay Bhanjang–Hati Sar, 2200–2700 m (Oct. 27, 1963); Hati Sar–Minchin Dhap, 2700–2800 m (Oct. 28, 1963); Minchin Dhap–Mul Pokhari, 2800–2400 m (Oct. 29, 1963); below Siling Tzokupa–Siling Tzokupa, 2100–3800 m (Nov. 21, 1963).

Distr. E. Himalaya (Nepal), W. China (Yunnan, Szechuan, Sikang), and Malaysia.

This is reported here for the first time.

Deyeuxia pulchella (Griseb.) Hook. f., Fl. Brit. Ind. **7**: 268 (1896)–Keng, Fl. Ill. Pl. Prim. Sinic. 509 (1959)–Bor, Grass. Ind. 399 (1960).

Calamagrostis pulchella Griseb. in Goett. Nachr. 78 (1868).

Phalut, 3500 m (Jun. 5, 1960); Jongri, 4000 m (May 23, 1960); Jongri–Olothang, 4000–3900 m (May 23, 1960).

Distr. Himalaya (Lahul to Sikkim), and W. China (Sikang, Yunnan).

Deyeuxia scabrescens (Griseb.) Munro ex Duthie in Atkins., Gaz. N. W. Ind., 628 (1882)–Fl. Brit. Ind. **7**: 267 (1896)–Keng, Fl. Ill. Pl. Prim. Sinic. 509 (1959)–Bor, Grass. Ind. 399 (1960).

Calamagrostis scabrescens Griseb. in Goett. Nachr. 79 (1868).

Olothang, 3900 m (May 23, 1960); Jongri–Base Camp, 4000–4500 m (May 25, 1960); Baroya Khimty–Thakma Khola, 2500–3100 m (Nov. 12, 1963); Thakma Khola–Yamphodin, 3300–2100 m (Nov. 17, 1963).

Distr. Himalaya (Kashmir, Nepal, Sikkim), temperate areas of North and East India, Assam, W. China (Yunnan, Szechuan, Sikang, Kiangsu).

Digitaria adscendens (HBK) Henr. in Blumea **1**: 92 (1934)–Ohwi in Act. Phytotax. Geobot. **11**: 30 (1942)–Keng, Fl. Ill. Pl. Prim. Sinic. 704 (1959)–Bor, Grass. Ind. 298 (1960)–Bor in Dansk Bot. Arkiv **20** (2): 157 (1962)–Hsu in Taiwania no. **9**: 41 (1963)–Bor, l.c. **23** (2): 151 (1965)–Owhi in Journ. Coll. Arts Sci. Chiba **4**: 317 (1965).

Panicum adscendens HBK, Nov. Gen. et Sp. Pl. **1**: 97 (1816).

Kathmandu Airport, 1400 m (Oct. 13, 1963); Dumhan, Taplejung Dist., by the Tamur River, 700 m (Oct. 31, 1963).

Distr. Widely distributed in the tropics of the Old World.

Digitaria cruciata (Nees) A. Camus in Fl. Gén. Indo-Chin. **7**: 399 (1922)–Keng, Fl. Ill. Pl. Prim. Sinic. 702 (1959)–Bor, Grass. Ind. 300 (1960)–Ohwi, l.c. **4**: 317 (1965).

Panicum cruciatum Nees ex Steud., Syn. Pl. Glum. **1**: 39 (1854).

Paspalum sanguinale Lamk. var. *cruciatum* Hook. f., Fl. Brit. Ind. **7**: 14 (1896).

Minchin Dhap–Mul Pokhari, 2800–2400 m (Oct. 29, 1963).

Distr. E. Himalaya (Nepal), Assim, and W. China (Yunnan, Szechuan).

Digitaria longiflora (Retz.) Pers., Syn. Pl. **1**: 85 (1805)–Ohwi in Act. Phytotax. Geobot. **11**: 30 (1942)–Reeder in Journ. Arn. Arb. **29**: 294 (1948)–Keng, Fl. Ill. Pl. Prim. Sinic. 696 (1959)–Bor, Grass. Ind. 302 (1960)–Bor in Dansk Bot. Arkiv **20** (2): 158 (1962)–Hsu in Taiwania no. **9**: 42 (1963)–Bor, l.c. **23** (2): 151 (1965).

Paspalum longiflorum Retz., Obs. Bot. **4**: 15 (1786)–Fl. Brit. Ind. **7**: 17 (1896).

Rangpo–Tista Bazar, 350–300 m (Jun. 18, 1960); Dumhan, Taplejung Dist., by the Tamur River, 700 m (Oct. 31, 1963); Ranga Pani–Ghorwa, 700–200 m (Dec. 9, 1963);

Gauriganja–Rangali, 200 m (Dec. 13, 1963).

Distr. Widely distributed in the tropics.

Digitaria microbachne (Presl) Henr. in Meded. Rijks Herb. no. **61**: 13 (1930)–Ohwi in Act. Phytotax. Geobot. **11**: 29 (1942)–Bor, Grass. Ind. 302 (1960)–Bor in Dansk Bot. Arkiv **20** (2): 158 (1962)–Hsu in Taiwania no. **9**: 43 (1963)–Bor, l.c. **23** (2): 151 (1965).

Panicum microbachne J. S. Presl ex C. B. Presl, Rel. Haenk. **1**: 298 (1830).

Digitaria pruriens (Fisch. ex Trin.) Büse in Miquel, Pl. Jungh. 379 (1854)–Reeder in Journ. Arn. Arb. **29**: 292 (1948).

Rayang, 250 m (Apr. 22, 1960).

Distr. Common in tropical Asia.

Digitaria Pentzii Stent in Bothalia **3**: 147 (1930)–Bor, Grass. Ind. 304 (1960).

Digitaria eriantha Steud. var. *stolonifera* Stapf in Dyer, Fl. Cap. **7**: 375 (1898).

Rangpo–Tista Bazar, 350–300 m (Jun. 18, 1960).

Distr. Originally from South Africa, now introduced into other warm countries.

Digitaria setigera Roth apud Roem. et Schult., Syst. Veg. **2**: 474 (1817)–Bor, Grass. Ind. 305 (1960)–Bor in Dansk Bot. Arkiv **20** (2): 151 (1965).

Paspalum sanguinale Lamk. var. *extensum* Hook. f., Fl. Brit. Ind. **7**: 15 (1896).

Gangtok, 1650 m (Jun. 13, 1960); Dhankuta, 1200 m (Oct. 19, 1963); Dumhan, Taplejung Dist., by the Tamur River, 700 m (Oct. 31, 1963); Dumhan, 700 m (Nov. 1, 1963); Baroya Khimty, 2500 m (Nov. 11, 1963); Helok–Baroya Khimty, 1500–2500 m (Nov. 15, 1963); Bharomdin–Tharpu, 1000–1200 m (Nov. 25, 1963); Tharpu, 1200 m (Dec. 7, 1963); Illam, 1200 m (Dec. 7, 1963).

Distr. E. Himalaya (Nepal, Sikkim), Assam, India, Burma, Thai, and Indo-China. This is a very variable species in which the lower glume is nearly absent. The length of the spikelet varies from 2.1 to 2.4 mm long. And it seems there are two series on the length of upper glume, the one 0.4 mm long (6302189–90, 6302195–96), and the other about 1 mm long (6502193–94, 6302197–98).

Digitaria stricta Roth ex Roem. et Schult., Syst. Veg. **2**: 474 (1817)–Bor, Grass. Ind. 305 (1960).

Paspalum Royleanum Nees ex Thw., Enum. Pl. Zeyl. 358 (1864), nomen et in Hook. f., Fl. Brit. Ind. **7**: 18 (1896), descr.

Nissim–Dumhan, 1500–700 m (Oct. 30, 1963).

Distr. E. Himalaya (Nepal, Sikkim), India, Burma, and Ceylon.

Digitaria timorensis (Kunth) Bal. in Morot, Journ. de Bot. **4**: 138 (1890)–Bor, Grass. Ind. 306 (1960)–Bor in Dansk Bot. Arkiv **20** (2): 159 (1962)–Hsu in Taiwania no. **9**: 43 (1963)–Bor, l.c. **23** (2): 151 (1965)–Ohwi in Journ. Coll. Arts Sci. Chiba **4**: 317 (1965).

Panicum timorense Kunth, Enum. Pl. **1**: 83 (1833).

Digitaria chinensis Horn., Suppl. Hort. Bot. Hafn. 8 (1819)–Ohwi in Act. Phytotax. Geobot. **11**: 29 (1942)–Keng, Fl. Ill. Pl. Prim. Sinic. 704 (1959).

Paspalum sanguinale Lamk. var. *debile* Hook. f., Fl. Brit. Ind. **7**: 16 (1896).

Rangpo–Tista Bazar, 350–300 m (Jun. 18, 1960); Kathmandu Airport, 1400 m (Oct. 13, 1963); Dumhan–Taplejung, 700–2000 m (Nov. 1, 1963).

Distr. South-east Asia, and Polynesia.

Digitaria violascens Link, Hort. Berol. **1**: 229 (1827)–Reeder in Journ. Arn.

Arb. **29**: 294 (1948)–Keng, Fl. Ill. Pl. Prim. Sinic. 697 (1959)–Bor, Grass. Ind. 307 (1960)–Bor in Dansk Bot. Arkiv **20** (2): 159 (1962)–Hsu in Taiwania no. **9**: 44 (1963)–Bor, l.c. **23** (2): 152 (1965).

Digitaria Ischaemum Muhl var. *asiatica* Ohwi in Act. Phytotax. Geobot **11**: 32 (1942).

Kalimpong, 1350 m (Jun. 20, 1960); Kathmandu Airport, 1400 m (Oct. 13, 1963).

Distr. Tropical regions.

Dimeria ornithopoda Trin., Fund. Agrost. 167, t. 14 (1820)–Fl. Brit. Ind. **7**: 104 (1896)–Ohwi in Act. Phytotax. Geobot. **11**: 146 (1942)–Reeder in Journ. Arn. Arb. **29**: 326 (1948)–Jansen in Reinwardtia **2** (2): 265 (1953)–Keng, Fl. Ill. Pl. Prim. Sinic. 745 (1959)–Bor, Grass. Ind. 142 (1960).

Kathmandu Airport, 1400 m (Oct. 13, 1963).

Distr. E. Himalaya (Nepal), Assam, India, tropical Asia, and Australia.

Echinochloa colonum (L.) Link, Hort. Berol. **2**: 209 (1833)–Ohwi in Act. Phytotax. Geobot. **11**: 36 (1942)–Reeder in Journ. Arn. Arb. **29**: 276 (1948)–Keng, Fl. Ill. Pl. Prim. Sinic. 674 (1959)–Bor, Grass. Ind. 308, f. 34 (1960)–Bor in Dansk Bot. Arkiv **20** (2): 159 (1962)–Hsu in Taiwania no. **9**: 44 (1963)–Bor, lc. **23** (2): 152 (1965)–Ohwi in Journ. Coll. Arts Sci. Chiba **4**: 317 (1965).

Panicum colonum L., Syst. Nat. ed. 10, **2**: 870 (1759)–Fl. Brit. Ind. **7**: 32 (1896).

Biratnagar, 200 m (Oct. 14, 1963); Dumhan, Taplejung Dist., by the Tamur River, 700 m (Oct. 31, 1963); Dumhan–Taplejung, 700–2000 m (Nov. 1, 1963).

Distr. Tropics of Asia and Africa.

Echinochloa Crusgalli (L.) P. Beaux., Ess. Agrost. 53, 161 (1812)–Ohwi in Act. Phytotax. Geobot. **11**: 36 (1942)–Reeder in Journ. Arn. Arb. **29**: 277 (1948)–Keng, Fl. Ill. Pl. Prim. Sinic. 673 (1959)–Bor, Grass. Ind. 310 (1960)–Bor in Dansk Bot. Arkiv **20** (2): 159 (1962)–Bor, l.c. **23** (2): 152 (1965)–Ohwi, l.c. **4**: 317 (1965).

Nissim–Dumhan, 1500–700 m (Oct. 30, 1963); Tharpu, 1200 m (Nov. 26, 1963).

Distr. All warm countries.

Echinochloa pyramidalis (Lamk.) Hitchc. et Chase in Contr. U.S. Nat. Herb. **18**: 345 (1917)–Bor, Grass. Ind. 311 (1960).

Panicum pyramidale Lamk., Tab. Encycl. **1**: 171 (1791).

Dumhan–Taplejung, 2000 m (Nov. 1, 1963); Sanichare–Sibganja, 200 m (Dec. 11, 1963; Sibganja–Mahara Bahara, 200 m (Dec. 12, 1963); Mahara Bahra–Kathgara, 200 m (Dec. 13, 1963).

Distr. Tropical Africa and America. Introduced to E. Himalaya (Nepal), India.

Eleusine coracana (L.) Gaertn., Fruct. **1**: 8, t. 1, f. 11 (1789)–Ohwi in Bot. Mag. Tokyo **55**: 312 (1941)–Keng, Fl. Ill. Pl. Prim. Sinic. 457 (1959)–Bor. Grass. Ind. 492 (1960).

Cynosurus coracanus L., Syst. Nat. ed. 10, **2**: 875 (1759).

Dhankuta, 1200 m (Oct. 20, 1963); Dumhan–Taplejung, 700–2000 m (Oct. 31, 1963; Nov. 1, 1965); Tharpu, 1200 m (Nov. 26, 1963).

Distr. Widely cultivated in E. Himalaya (Nepal, Sikkim), India, China, and Japan.

Eleusine indica (L.) Gaertn., Fruct. **1**: 8 (1789)–Fl. Brit. Ind. **7**: 293 (1896) Ohwi in Bot. Mag. Tokyo **55**: 312 (1941)–Keng, Fl. Ill. Pl. Prim. Sinic. 457 (1959)

-Bor, Grass. Ind. 495 (1960)-Bor in Dansk Bot. Arkiv **20** (2): 145 (1962)-Bor, l.c. **23** (2): 145 (1965)-Ohwi, l.c. **4**: 318 (1965).

Cynosurus indicus L., Sp. Pl. ed. 1, 72 (1753).

Rangpo-Tista Bazar, 350-300 m (Jun. 18, 1960); Minchin Dhap-Mul Pokhari, near Taplejung, 2800-2400 m (Oct. 29, 1963); Bharomdin-Tharpu, 1000-1200 m (Nov. 25, 1963); Sanichare-Sibganja, 200 m (Dec. 11, 1963); Sibganja-Mahara Bahara, 200 m (Dec. 12, 1963).

Distr. Tropical and subtropical countries.

Elytrophorus spicatus (Willd.) A. Camus in Fl. Gén. Indo-Chin. **7**: 547 (1923)-Keng, Fl. Ill. Pl. Prim. Sinic. 333 (1959)-Bor, Grass. Ind. 493 (1960).

Dactylis spicata Willd. in Ges. Naturf. Freunde Berlin, Neue Schrift **3**: 416 (1801).

Elytrophorus articulatus P. Beauv., Ess. Agrost. 67, t. 14, f. 2 (1812)-Fl. Brit. Ind. **7**: 306 (1896).

Sibganja-Gauriganja, 200m (Dec. 12, 1963); Kathgara-Rangali, 200m (Dec. 14, 1963).

Distr. Tropical Asia, Africa, and Australia.

Eragrostiella nardoides (Trin.) Bor in Ind. Forester. **66**: 270 (1940)-Bor, Grass. Ind. 495 (1960)-Ohwi in Journ. Coll. Arts Sci. Chiba **4**: 317 (1965).

Eragrostis nardoides Trin. in Mém. Acad. Sci. Pétersb. sér. 6, **1**: 415 (1830)-Fl. Brit. Ind. **7**: 326 (1896).

Phusri-Dhara Pani, 450-900 m (Oct. 16, 1963); Bharomdin-Tharpu, 1000-1200 m (Nov. 25, 1963).

Distr. E. Himalaya (Nepal), and India.

Eragrostis atrovirens (Desf.) Trin. ex Steud., Nom. Bot. ed. 2, **1**: 562 (1840)-Bor, Grass. Ind. 503 (1960)-Bor in Dansk Bot. Arkiv **20** (2): 146 (1962)-Bor, l.c. **23** (2): 145 (1965)-Ohwi, l.c. **4**: 317 (1965).

Dumhan, Taplejung Dist., by the Tamur River, 700 m (Oct. 31, 1963); Sibganja-Mahra Bahara, 200 m (Dec. 12, 1963).

Distr. Africa, Mascarenes, India, E. Himalaya (Nepal), Assam, Thai, and Malaysia.

Resembles *E. perennans* Keng in having eglandular plant-body and the lowest lemma which is more than 2 mm long.

Eragrostis cylindrica (Roxb.) Nees ex Hook. et Arn., Bot. Beech. Voy. 251 (1841)-Ohwi in Bot. Mag. Tokyo **55**: 277 (1941)-Keng, Fl. Ill. Pl. Prim. Sinic. 302 (1959).

Poa cylindrica Roxb., Fl. Ind. ed. Carey, **1**: 335 (1820).

Dhankuta, 1200 m (Oct. 21, 1963).

Distr. E. Himalaya (Nepal), Indo-China, S. China, and Formosa.

This is a new record from Nepal.

Eragrostis japonica (Thunb.) Trin. in Mém. Acad. Sci. Pétersb., sér. 6, **1**: 405 (1831)-Henr. in Blumea **3**: 423-24 (1940)-Jansen in Reinwardtia **2**: 274 (1953)-Bor, Grass. Ind. 509 (1960)-Bor in Dansk Bot. Arkiv **20** (2): 147 (1962).

Poa japonica Thunb., Fl. Jap. 51 (1784).

Eragrostis interrupta P. Beauv. var. *tenuissima* Stapf ex Hook. f., Fl. Brit. Ind. **7**: 316 (1896).

Eragrostis tenella auct.-Ohwi in Bot. Mag. Tokyo **55**: 275 (1941)-Keng, Fl. Ill. Pl. Prim. Sinic. 320 (1959).

Nissim–Dumhan, 1500–700 m (Oct. 30, 1963); Dumhan, Taplejung Dist., by the Tamur River, 700 m (Oct. 31, 1963); Dumhan–Taplejung, 700–1000 m (Nov. 1, 1963); Bharomdin–Tharpu, 1000–1200 m (Nov. 25, 1963).

Distr. Africa, E. Himalaya (Nepal), India, Thai, China, Korea, Japan, Malaysia.

Eragrostis nigra Nees ex Steud., Syn. Pl. Glum. **1**: 267 (1854)–Fl. Brit. Ind. **7**: 324 (1896)–Keng, Fl. Ill. Pl. Prim. Sinic. 311 (1959)–Bor, Grass. Ind. 511 (1960) –Ohwi, l.c. **4**: 317 (1965).

Rimbick, 2200 m (May 5, 1960); Kalimpong, 1300 m (Jun. 19, 20, 1960); Darjeeling, 2000 m (Jun. 24, 1960); Sinduwa, Dhankuta Dist., 2100 m (Oct. 23, 1963); Bilbatay Bhanjang–Hati Sar, 2200–2700 m (Oct. 27, 1963); Nissim–Dhmhan, 1500–700 m (Oct. 30, 1963); Iladanda–Selap, 1800–2600 m (Nov. 9, 1963); Baroya Khimty–Thakma Khola, 2500–3100 m (Nov. 12, 1963).

Distr. India, Ceylon, and W. China (Yunnan, Kueichow, Sikang, Kiangsu).

Eragrostis nutans (Retz.) Nees ex Steud., Nom. Bot. ed. 2, 563 (1840)–Bor, Grass. Ind. 511 (1960)–Ohwi in Bull. Sci. Mus. Tokyo **6**: 120 (1962).

Poa nutans Retz., Obs. Bot. **4**: 19 (1786).

Poa Chariis Schult., Syst. Veg. **2**: 314 (1824).

Eragrostis stenophylla sensu Hook. f., Fl. Brit. Ind. **7**: 318 (1896) p.p.; non Hochst. (1851).

Eragrostis Chariis (Schult.) Hitchc. in Lingnan Sci. Journ. **7**: 193 (1931)–Ohwi in Bot. Mag. Tokyo **55**: 278 (1941)–C. E. Hubb. in Kew Bull. **1949**: 345 (1949)–Jansen in Reinwardtia **2** (2): 269 (1953)–Keng, Fl. Ill. Pl. Prim. Sinic. 304 (1959).

Gangtok, 1600 m (Jun. 15, 1960).

Distr. E. Himalaya (Sikkim), India, S. China (Kwangsi, Yunnan), and Malaysia.

Eragrostis pilosa (L.) P. Beauv., Ess. Agrost. 71, 162, 175 (1812)–Fl. Brit. Ind. **7**: 323 (1896)–Ohwi in Bot. Mag. Tokyo **55**: 277 (1941)–Keng, Fl. Ill. Pl. Prim. Sinic. 313 (1959)–Bor, Grass. Ind. 512 (1960).

Poa Eragrostis Walt., Fl. Carol. 80 (1788); non *P. Eragrostis* L. (1753).

Kathgara–Rangali, 200 m (Dec. 14, 1963).

Distr. All warm regions of the Old World.

Eragrostis tenella (L.) P. Beauv. ex Roem. et Schult., Syst. Veg. **2**: 576 (1817)–Jansen in Reinwardtia **2**: 274 (1953)–Bor, Grass. Ind. 513 (1960)–Bor in Dansk Bot. Arkiv **20** (2): 147 (1962)–Bor, l.c. **25** (2): 146 (1965)–Ohwi in Journ. Coll. Arts Sci. Chiba **4**: 317 (1965).

Poa amabilis L., Sp. Pl. ed. 1, 68 (1753).

Poa tenella L., Sp. Pl. ed. 1, 69 (1753).

Poa plumosa Retz., Obs. Bot. **4**: 20 (1786).

Eragrostis amabilis (L.) Wight et Arn. ex Hook. et Arn., Bot. Beechey Voy. 221 (1838)–Ohwi in Bot. Mag. Tokyo **55**: 275 (1941)–Keng, Fl. Ill. Pl. Prim. Sinic. 319 (1959).

Eragrostis tenella Roem. et Schult. var. *plumosa* (Retz.) Stapf in Hook. f., Fl. Brit. Ind. **7**: 315 (1896).

Rayang, 250 m (Apr. 20, 1960); Kathmandu Airport, 1400 m (Oct. 13, 1963); Dhankuta, 1200 m (Oct. 21, 1963).

Distr. E. Himalaya (Nepal), India, S. China, Ryukyu, and Malaysia.

Eragrostis tremula Hochst. ex Steud., Syn. Pl. Glum. **1**: 269 (1854)–Fl. Brit.

Ind. 7: 320 (1896)-Bor, Grass. Ind. 514 (1960).

Poa tremula Lamk., Tab. Encycl. **1**: 185 (1791).

Phusri-Dhara Pani, 450-900 m (Oct. 16, 1963).

Distr. E. Himalaya (Nepal), India, Burma to Tropical Africa.

Eragrostis unioloides (Retz.) Nees ex Steud., Syn. Pl. Glum. **1**: 264 (1854)-Ohwi in Bot. Mag. Tokyo **55**: 275 (1941)-Keng, Fl. Ill. Pl. Prim. Sinic. 317 (1959) Bor, Grass. Ind. 515 (1960)-Bor in Dansk Bot. Arkiv **20** (2): 147 (1962)-Ohwi, l.c. **6**: 121 (1962).

Poa unioloides Retz., Obs. Bot. **5**: 19 (1789).

Eragrostis amabilis Wight et Arn. sensu Hook. f., Fl. Brit. Ind. **7**: 317 (1896).

Sunderijal Waterfall, near Kathmandu, 1600 m (Sept. 17, 1963); Kathmandu, 1400 m (Oct. 13, 1963); Biratnagar, 200 m (Oct. 14, 1963); Phusri-Dhara Pani, 450-900 m (Oct. 16, 1963); Nissim-Dumhan, 1500-700 m (Oct. 30, 1963); Dumhan, Taplejung Dist., by the Tamur River, 700 m (Oct. 31, 1963); Dumhan-Taplejung, 700-2000 m (Nov. 1, 1963); Bharomdin-Tharpu, 1000-1200 m (Nov. 25, 1963).

Distr. Tropical regions of Asia and Africa.

Erianthus longisetosus Anderss. in Oefers. K. Vet. Akad. Forh. Stockh. 163 (1855)-Fl. Brit. Ind. **7**: 124 (1896)-Bor, Grass. Ind. 151 (1960)-Bor in Dansk Bot. Arkiv **20** (2): 170 (1962).

Helok, 1500 m (Nov. 7, 1963); Dhara Pani-Illam, 1500-1200 m (Dec. 5, 1963); Ranga Pani-Ghorwa, 700-300 m (Dec. 9, 1963).

Distr. E. Himalaya (Nepal, Sikkim), Assam, and Thai.

var. **Hookeri** (Hack.) Bor, Grass. Ind. 151 (1960).

Erianthus Hookeri Hack. in DC., Monogr. Phan. **6**: 141 (1889)-Fl. Brit. Ind. **7**: 125 (1896).

Dhara Pani-Illam, 1500-1200 m (Dec. 5, 1963); Sibganja-Mahara Bahara, 200 m (Dec. 12, 1963).

Distr. E. Himalaya (Nepal, Sikkim, Bhutan), and W. China (Yunnan).

Erianthus Ravennae (L.) P. Beauv., Ess. Agrost. 14 (1812)-Fl. Brit. Ind. **7**: 121 (1896)-Bor, Grass. Ind. 151 (1960).

Andropogon Ravennae L., Sp. Pl. ed. 2, 1481 (1763).

Erianthus elephantinus Hook. f., Fl. Brit. Ind. **7**: 122 (1896).

Phusri-Dhara Pani, 450-900 m (Oct. 16, 1963); Dhankuta, 1200 m (Oct. 19, 1963); Taplethok-Helok, 1300-1500 m (Nov. 6, 1963); Helok-Baroya Khimty, 1500-2500 m (Nov. 10, 1963); Dhara Pani-Illam, 1500-1200 m (Dec. 5, 1963).

Distr. Mediterranean, Himalaya (Nepal), Assam, and Tibet.

Erianthus rufipilus (Steud.) Griseb. in Nachr. Ges. Wiss. Göttingen 93 (1868)-Bor, Grass. Ind. 152 (1960).

Saccharum rufipilum Steud., Syn. Pl. Glum. **1**: 409 (1855).

Erianthus fulvus Nees ex Steud., l.c. 409, nom. nud. ex Hack. in DC., Monogr. Phan. **6**: 147 (1889)-Fl. Brit. Ind. **7**: 123 (1896)-Keng, Fl. Ill. Pl. Prim. Sinic. 654 (1956).

Dhara Pani-Illam, 1500-1200 m (Dec. 5, 1963).

Distr. North and north-east India, Himalaya (Kashmir, Nepal, Sikkim) to W. China (Yunnan, Kweichow, Szechuan).

Erianthus sikkimensis Hook. f., Fl. Brit. Ind. **7**: 123 (1896)-Bor, Grass.

Ind. 152 (1960).

Illam–Ranga Pani, 1200–700 m (Dec. 8, 1963).

Distr. E. Himalaya (Nepal, Sikkim, Bhutan).

Eulalia Leschenaultiana (Decne.) Ohwi in Bull. Sci. Mus. Tokyo no. **18**: (1947)–Bor, Grass. Ind. 155 (1960)–Bor in Dansk Bot. Arkiv **20** (2): 171 (1962); l.c. **23** (2): 161 (1965).

Andropogon Leschenaultianus Decne., Herb. Timor. Descr. 29 (1835).

Pollinia Cumingii Nees in Hook. Journ. Bot. **2**: 98 (1850).

Eulalia Cumingii (Nees) A. Camus in Fl. Gén. Indo-Chin. **7**: 250 (1922)–Keng. Fl. Ill. Pl. Prim. Sinic. 781 (1959).

Ranga Pani–Ghorwa, 700–300 m (Dec. 9, 1963).

Distr. E. Himalaya (Nepal) India, Thai, S. China (Kwangtung, Fokien), Formosa, Micronesia, Malaysia to Australia.

Eulalia mollis (Griseb.) O. Kuntze, Rev. Gen. Pl. **2**: 775 (1891)–Bor, Grass. Ind. 156 (1960).

Erianthus mollis Griseb. in Nachr. Ges. Wiss. Göttingen 92 (1868).

Pollinia mollis (Griseb.) Hack. in DC., Monogr. Phan. **6**: 161 (1889)–Fl. Brit. Ind. **7**: 111 (1896).

Bilbatay Bhanjang, 2200 m (Oct. 24, 1963); Sinduwa, 2100 m (Oct. 24, 1963).

Distr. Temperate Himalaya, and Northwest India.

Festuca leptopogon Stapf in Hook. f., Fl. Brit. Ind. **7**: 354 (1896)–Keng, Fl. Ill. Pl. Prim. Sinic. 122 (1959)–Bor, Grass. Ind. 538 (1960).

Birch Hill, Darjeeling, 2000 m (Jun. 18, 1960); Ghum, 2200 m (Jun. 20, 1960).

Distr. E. Himalaya (Sikkim), Assam to W. China (Yunnan).

Festuca polycolea Stapf in Hook. f., Fl. Brit. Ind. **7**: 349 (1896)–Bor, Grass. Ind. 540 (1960).

Festuca ovina L. subsp. *polycolea* (Stapf) St. Yves in Candollea **3**: 373 (1928).

Jongri, 4100 m (May 22, 1960); Jongri–Olothang, 3900 m (May 23, 1960); Gamothang, 3800 m (May 29, 1960).

Distr. E. Himalaya (Nepal, Sikkim, Bhutan), and Tibet.

Garnotia Emodi (Arn. et Nees) Janowsky in Fedde, Rep. **17**: 86 (1921)–Bor, Grass. Ind. 567 (1960).

Garnotia polypogonoides Munro ex Oliver in Hook., Icon. Pl. t. 1481 (1885)–Fl. Brit. Ind. **7**: 243 (1896).

Phusri–Dhara Pani, 450–900 m (Oct. 16, 1963); Bilbatay Bhanjang, 2200 m (Oct. 26, 1963); Zongi–Iladanda, 2600 m–1800 m (Nov. 12, 1963); Iladanda–Helok, 1800–1500 m (Nov. 13, 1963).

Distr. Temperate Himalaya (Garhwal, Nepal, Sikkim).

Helictotrichon virescens (Nees ex Steud.) Henr. in Blumea **3**: 425 (1940)–Bor, Grass. Ind. 439 (1960).

Avena aspera Munro var. *Roylei* Hook. f., Fl. Brit. Ind. **7**: 277 (1896).

Helictotrichon Roylei (Hook. f.) Keng, Clav. Gram. Prim. Sinic. 200 (1957)–Keng, Fl. Ill. Pl. Prim. Sinic. 490 (1959).

Sinduwa, Dhankuta Dist., 2100 m (Oct. 23 & 24, 1963); Bilbatay Bhanjang, 2200 m (Oct. 25, 1963); Bilbatay Bhanjang–Hati Sar, 2200–2700 m (Oct. 27, 1963); Hati Sar–Minchin Dhap, 2700–2800 m (Oct. 28, 1963); Minchin Dhap–Mul Pokhari, 2800–2400 m (Oct. 29, 1963); above Lelep, 2600 m (Nov. 9, 1963); Boroya Khimty–Thakma Khola, 2500–3100 m (Nov. 12, 1963); Iladanda–Helok, 1800–1500m (Nov. 13, 1963); Helok–Baroya Khimty, 1500–2500m (Nov. 15, 1963); Baroya Khimty–Thakma Khola 2500–3300 m (Nov. 16, 1963); below Siling Tzokupa–Siling Tzokupa, 2100–3800 m (Nov. 21, 1963); Batasay–Bhuspate Danra, 2400–2900 m (Dec. 1, 1963).

Distr. Himalaya (Kashmir, Nepal), and W. China (Yunnan).

Hemarthria compressa (L. f.) R. Br., Prodr. 207 (1810)–Ohwi in Act. Phytotax. Geobot. **11**: 177 (1942)–Keng, Fl. Ill. Pl. Prim. Sinic. 800 (1959)–Bor, Grass. Ind. 161 (1960).

Rottboellia compressa L. f., Suppl. Pl. 114 (1781)–Fl. Brit. Ind. **7**: 153 (1896).

Godavari, near Kathmandu, 1500 m (Sep. 18, 1963).

Distr. Warmer part of Spain, Canaries, E. Himalaya (Nepal), India, Ceylon, Burma, S. W. China (Kwangtung, Kwangsi, Yunnan), and Malaysia.

Heteropogon contortus (L.) P. Beauv. ex Roem. et Schult., Syst. Veg. **2**: 836 (1817)–Ohwi in Act. Phytotax. Geobot. **11**: 170 (1942)–Reeder in Journ. Arn. Arb. **29**: 376 (1948)–Keng, Fl. Ill. Pl. Prim. Sinic. 843 (1959)–Bor, Grass. Ind. 163 (1960)–Bor in Dansk Bot. Arkiv **20** (2): 173 (1962); l.c. **23** (2): 163 (1965).

Andropogon contortus L., Sp. Pl. ed. 1, 1045 (1753)–Fl. Brit. Ind. **7**: 199 (1896).

Kathmandu Airport, 1400 m (Oct. 13, 1963); Phusri–Dhara Pani, 450–900 m (Oct. 16, 1963); Dhankuta, 1200 m (Oct. 19, 21, 1963).

Distr. Distributed in the tropics generally.

Holcus lanatus L., Sp. Pl. ed. 1, 1048 (1753)–Fl. Brit. Ind. **7**: 274 (1896)–Ohwi in Journ. Jap. Bot. **17**: 449 (1941)–Keng, Fl. Ill. Pl. Prim. Sinic. 502 (1959)–Bor, Grass. Ind. 443 (1960).

Rimbick, 2200 m (May 5, 1960).

Distr. Europe, and temperate Asia. In many parts of the world it has been introduced and has run wild.

Hordeum vulgare L., Sp. Pl. ed. 1, 84 (1753)–Fl. Brit. Ind. **7**: 371 (1896)–Keng, Fl. Ill. Pl. Prim. Sinic. 440 (1959)–Bor, Grass. Ind. 677 (1960)–Ohwi in Journ. Coll. Arts Sci. Chiba **4**: 317 (1965).

Ramam–Phalut, 2400–3500 m (May 9, 1960).

Distr. Cultivated as a main food everywhere in suitable climates.

Hygroryza aristata (Retz.) Nees ex Wight et Arn. in Edinb. New Philos. Journ. **15**: 380 (1833)–Fl. Brit. Ind. **7**: 95 (1896)–Ohwi in Journ. Jap. Bot. **17**: 496 (1941)–Keng, Fl. Ill. Pl. Prim. Sinic. 633 (1959)–Bor, Grass. Ind. 597, f. 67 (1960)–Bor in Dansk Bot. Arkiv **20** (2): 15 (1962); l.c. **23** (2): 147 (1965).

Pharus aristatus Retz., Obs. Bot. **5**: 23 (1789).

Sibganja–Gauriganja, 200 m (Dec. 12, 1963).

Distr. E. Himalaya (Nepal), India, Ceylon, Burma, Thai, Indo-China, S. China (Fokien, Kwangtung), Formosa, and Malaysia.

Hymenachne pseudointerrupta C. Muell. in Bot. Zeits. **19**: 333 (1861)–Bor, Grass. Ind. 313 (1960)–Bor in Dansk Bot. Arkiv **20** (2): 161 (1962)–Hsu in Taiwania no. **9**: 46 (1963)–Bor, l.c. **23** (2): 152 (1965).

Panicum myuros sensu Hook. f., Fl. Brit. Ind. **7**: 39 (1896); non Lamk. (1791).

Hymenachne amplexicaulis sensu auct.–Bor in Fl. Assam **5**: 218 (1940)–Ohwi in Act. Phytotax. Geobot. **11**: 48 (1942)–Reeder in Journ. Arn. Arb. **29**: 289 (1948).

Sibganja–Mahara Bahara, 200 m (Dec. 12, 1963).

Distr. E. Himalaya (Nepal), Assam, Burma, Thai, Indo-China, S. W. China (Yunnan, Hainan), Formosa to Malaysia, and Polynesia.

Imperata cylindrica (L.) P. Beauv. var. **major** (Nees) C. E. Hubb. ex Hubb. et Vaughan, Grass. Maur. 96 (1940)–Reeder in Journ. Arn. Arb. **29**: 327 (1948)–Keng, Fl. Ill. Pl. Prim. Sinic. 755 (1959)–Bor, Grass. Ind. 169 (1960)–Hsu in Journ. Jap. Bot. **37**: 280 (1962).

Imperata arundinacea Cyrill, Pl. Rar. Neap. **2**: 26, t. 11 (1792)–Fl. Brit. Ind. **7**: 106 (1896).

Imperata Koenigii Retz. var. *major* Nees, Fl. Afr. Austr. 90 (1841).

Imperata cylindrica var. *Koenigii* (Retz.) Dur. et Schinz, Consp. Flor. Afr. **5**: 694 (1894)–Ohwi in Act. Phytotax. Geobot. **11**: 146 (1942).

Pamianchi–Tingling Bridge, 2000–1000 m (May 15, 1960); Dumhan–Taplejung, 700–2000 m (Nov. 1, 1963).

Distr. Warm and temperate regions of Asia and Australia, extending to East and South Africa.

Isachne albens Trin., Sp. Gram. 1, t. 85 (1826)–Fl. Brit. Ind. **7**: 22 (1896)–Ohwi in Act. Phytotax. Geobot. **11**: 54 (1942)–Reeder in Journ Arn. Arb. **29**: 309 (1948)–Jansen in Reinwardtia **2** (2): 280 (1953)–Keng, Fl. Ill. Pl. Prim. Sinic., 640 (1959)–Bor, Grass. Ind. 579 (1960)–Bor in Dansk Bot. Arkiv **20** (2): 150 (1962)–Ohwi in Bull. Nat. Sci. Mus. **6**: 121 (1962).

Darjeeling, 2150 m (Apr. 4, 1960); Rayang, 250 m (Apr. 20, 1960); Batasi–Palmajua, 2000–2300 m (May, 3, 1960); Kalimpong, 1350 m (Jun. 20, 1960); Godavari, near Kathmandu, 1500 m (Sep. 18, 1963); Nissim–Dumhan, 1500–700 m (Oct. 30, 1963); Taplejung–Garhi Danra, 2000–2200 m (Nov. 3, 1963); Helok–Iladanda, 1500–1800 m (Nov. 8, 1963); Iladanda–Selap, 1800–2600 m (Nov. 9, 1963).

Distr. E. Himalaya (Nepal, Sikkim), India, Thai, Indo-China, W. China (Yunnan, Szechuan, Kweichow, Kwangtung, Kwangsi), Formosa to Malaysia, and Africa.

Isachne miliacea Roth, Nov. Pl. Sp. 58 (1821)–Fl. Brit. Ind. **7**: 25 (1896)–Reeder in Journ. Arn. Arb. **29**: 315 (1948)–Jansen in Reinwardtia **2** (2): 285 (1953)–Bor, Grass. Ind. 582 (1960)–Bor in Dansk Bot. Arkiv **20** (2): 150 (1962).

Nissim–Dumhan, 1500–700 m (Oct. 30, 1963); Dumhan, Taplejung Dist., by the Tamur River, 700 m (Oct. 31, 1963).

Distr. India, Ceylon, Burma, Thai, China, Malaysia, and Pacific Islands.

Isachne sikkimensis Bor in Kew Bull. **1949**: 115 (1949)–Bor, Grass. Ind. 582 (1960).

Hati Sar–Minchin Dhap, 2700–2800 m (Oct. 28, 1963).

Distr. E. Himalaya (Nepal, Sikkim).

Ischaemum rugosum Salisb., Icon. Stirp. Rar. 1, t. 1 (1791)–Fl. Brit. Ind. **7**: 127 (1896)–Ohwi in Act. Phytotax. Geobot. **11**: 175 (1942)–Keng, Fl. Ill. Pl. Prim. Sinic. 790 (1959)–Bor, Grass. Ind. 184 (1960)–Bor in Dansk Bot. Arkiv **23** (2): 164 (1965).

Dumhan–Taplejung, 700–2000 m (Nov. 1, 1963); Ghorwa–Sanichare, 300–200 m (Dec. 10, 1963).

Distr. E. Himalaya (Nepal), India, Burma, Thai, Indo-China, and Malaya.

var. **segetum** (Trin.) Hack. in DC., Monogr. Phan. **6**: 208 (1889)–Ohwi in

Act. Phytotax. Geobot. **11**: 175 (1942)–Keng, Fl. Ill. Pl. Prim. Sinic. 791 (1959).

Dumhan, Taplejung Dist., 700 m (Oct. 28, 1963); Rangali–Biratnagar, 200 m (Dec. 15, 1963).

Distr. India to China.

This is a variable species which is found in plains and low hills. One variety var. *segetum* Hack. (in DC., Monogr. Phan. **6**: 208, 1889) is separated by its much reduced pedicelled spikelets. It seems growing mainly in W. China (Yunnan, Kwangtung, Kwangsi), Formosa and Philippines.

Koeleria argentea Griseb. in Goett. Nachr. 77 (1868)–Fl. Brit. Ind. **7**: 309 (1896)–Bor, Grass. Ind. 444 (1960).

Jongri–Olothang, 4000–3900 m (May 23, 1960).

Distr. Alpine parts of Tibet, and Himalaya.

Leersia hexandra Swartz, Prod. Veg. Ind. Occ. 21 (1788)–Fl. Brit. Ind. **7**: 94 (1896)–Ohwi in Journ. Jap. Bot. **17**: 498 (1941)–Keng, Fl. Ill. Pl. Prim. Sinic. 631 (1959)–Bor, Grass. Ind. 599, f. 68 (1960)–Bor in Dansk Bot. Arkiv **20** (2): 151 (1962); l.c. **23** (2): 147 (1965).

Ghorwa–Sanichare, 300–200 m (Dec. 10, 1963); Sibganja–Gauriganja, 200 m (Dec. 12, 1963).

Distr. Subtropical Himalaya, Ceylon, Burma, Malay, S. China (Fokien), Formosa, and Ryukyu.

Microstegium ciliatum (Trin.) A. Camus in Ann. Soc. Linn. Lyon n.s. **68**: 201 (1921)–Ohwi in Act. Phytotax. Geobot. **11**: 157 (1942)–Reeder in Journ. Arn. Arb. **29**: 337 (1948)–Jansen in Reinwardtia **2** (2): 305 (1953)–Bor, Grass. Ind. 193 (1960)–Bor in Dansk Bot. Arkiv **20** (2): 174 (1962); l.c. **23** (2): 164 (1965).

Pollinia ciliata Trin. in Mém. Acad. Sci. Pétersb. sér. 6, **2**: 306 (1833)–Fl. Brit. Ind. **7**: 116 (1896).

Andropogon biaristatus Steud., Syn. Pl. Glum. **1**: 379 (1854).

Microstegium biaristatum (Steud.) Keng in Sinensia **3**: 92 (1932)–Keng, Fl. Ill. Pl. Prim. Sinic. 772 (1959).

Pouwa, Kathmandu, 1600 m (Oct. 9, 1963); Dhankuta, 1200 m (Oct. 19, 1963); Mul Pokhari–Dumhan, 2400–700 m (Oct. 30, 1963); Garhi Danra–Tuwa, 2200–1800 m (Nov. 4, 1963); Tharpu, 1200 m (Nov. 26, 1963); Illam, 1200 m (Dec. 7, 1963); Ranga Pani–Ghorwa, 700–300 m (Dec. 9, 1963).

Distr. E. Himalaya (Nepal), India, Burma, Thai, S. China, and Formosa.

The most striking character of this species is the reduced sterile palea of medium size which is about 1 mm long. Further differences are seen in the deeply furrowed first glume of the sessile spikelets and long ciliated rachis-joints. There are two series of plants, the one has sterile palea 1.1 mm long (6302305; 6302311), the other has less than 0.6 mm long (6302306–10). Regarding to the length of the sterile palea, *M. nudum* has its length equalling the glumes, and on the other hand the sterile palea is varied from minute to as long as the spikelet in *M. vimineum*. The length of the spikelet varies from 3 mm to 5 mm long, and usually it is longer in those specimens which are collected from the mountaineous regions.

Microstegium nudum (Trin.) A. Camus in Ann. Soc. Linn. Lyon n.s. **68**: 201 (1921)–Ohwi in Act. Phytotax. Geobot. **11**: 156 (1942)–Reeder in Journ. Arn.

Arb. **29**: 338 (1948)–Keng, Fl. Ill. Pl. Prim. Sinic. 774 (1959)–Bor, Grass. Ind. 194 (1960).

Pollinia nuda Trin. in Mém. Acad. Sci. Pétersb. sér. 6, **2**: 307 (1833)–Fl. Brit. Ind. **7**: 117 (1896).

Batasay–Bhuspate Danra, 2400–2900 m (Dec. 1, 1963).

Distr. India and South-east Asia generally, extending to Korea and Japan.

The rachis-joints are glabrous in this species. They are very slender, equalling or exceeding the sessile spikelet.

Microstegium vagans (Nees ex Steud.) A. Camus in Ann. Soc. Linn. Lyon, n.s. **68**: 200 (1921)–Bor, Grass. Ind. 195 (1960).

Pollinia vagans Nees ex Steud., Syn. Pl. Glum. **1**: 410 (1855)–Fl. Brit. Ind. **7**: 115 (1896).

Taplethok–Helok, 1300–1500 m (Nov. 6, 1963); Khebang 1400 m (Nov. 23, 1963).

Distr. E. Himalaya (Nepal), North-eastern India, and Burma.

Microstegium vimineum (Trin.) A. Camus in Ann. Soc. Linn. Lyon, n.s. **68**: 201 (1921)–Ohwi in Act. Phytotax. Geobot. **11**: 156 (1942)–Keng, Fl. Ill. Pl. Prim. Sinic., 777 (1959).

Andropogon vimineus Trin. in Mém. Acad. Sci. Pétersb. sér. 6, **2**: 268 (1832).

Pollinia imberbis Nees ex Steud., Syn. Pl. Glum. **1**: 410 (1855)–Fl. Brit. Ind. **7**: 117 (1896).

Sinduwa, Dhankuta Dist., 2100 m (Oct. 23, 1963); Dumhan, Taplejung Dist., by the Tamur River, 700 m (Oct. 31, 1963).

Distr. E. Himalaya (Nepal, Sikkim), North-eastern India, Assam to South-east Asia, China, Formosa, Korea, and Japan.

Miscanthus nepalensis (Trin.) Hack. in DC., Monogr. Phan. **6**: 104 (1889)–Fl. Brit. Ind. **7**: 107 (1896)–Keng, Fl. Ill. Pl. Prim. Sinic. 754 (1959)–Bor, Grass. Ind. 196 (1960).

Eulalia nepalensis Trin. in Mém. Acad. Sci. Pétersb. sér. 6, **2**: 333 (1832).

Kurseong, 1600 m (Apr. 12, 1960); Batasi–Palmajua, 2300–2600 m (May 3, 1960); Dhankuta–Hilay, 1200–1800 m (Oct. 23, 1963); Sinduwa, Dhankuta Dist., 2100 m (Oct. 23, 1963); Minchin Dhap–Mul Pokhari, 2800–2400 m (Oct. 29, 1963); Taplejung-Garhi Danra, 2000–2200 m (Nov. 3, 1963); Tuwa–Taplethok, 1800–1300 m (Nov. 5, 1963); Baroya Khimty–Thakma Khola, 2500–3100 m (Nov. 12, 1963); Tharpu-near Chyangthaphu, 1200–1100 m (Nov. 26, 1963); near Chyangthaphu–Birwa, 1100–1200 m (Nov. 27, 1965); Akasay–Batasay, 2300–2400 m (Nov. 30, 1963); Bhuspate Danra–Mai Majuwa, 2900–1600 m (Dec. 3, 1963).

Distr. Himalaya (Garhwal to Bhutan), Assam, Burma, extending to W. China (Yunnan, Szechuan, Sikang).

Muhlenbergia Huegelii Trin. in Mém. Acad. Sci. Pétersb. sér. 6, **6** (2): 41 et 293 (1841)–Ohwi in Bot. Mag. Tokyo **55**: 397 (1941)–Keng, Fl. Ill. Pl. Prim. Sinic. 563 (1959)–Bor, Grass. Ind. 401 (1960).

Muhlenbergia viridissima Nees ex Steud., Syn. Pl. Glum. **1**: 178 (1854)–Fl. Brit. Ind. **7**: 259 (1896).

Sinduwa, Dhankuta Dist., 2100 m (Oct. 23, 1963); Dhankuta–Murhay, 1200–2000 m (Oct. 23, 1963); Helok–Iladanda, 1500–1800 m (Nov. 8, 1963); Zongi-Iladanda, 2600–1800 m (Nov. 12, 1963).

Distr. Temperate regions of Himalaya, China, Amur, Korea, Japan, Formosa, and Philippines.

Narenga porphyrocoma (Hance) Bor in Ind. Forester. **66**: 267 (1940)-Bor, Grass Ind. 198 (1960)-Hsu in Journ. Jap. Bot. **37**: 279 (1962).

Eriochrysis Narenga Nees ex Steud., Syn. Pl. Glum. **1**: 411 (1855).

Eriochrysis porphyrocoma Hance ex Trin. in Journ. Bot. **14**: 294 (1876).

Saccharum Narenga (Nees) Wallich ex Hack. in DC., Monogr. Phan. **6**: 119 (1889)-Fl. Brit. Ind. **7**: 120 (1896)-Ohwi in Act. Phytotax. Geobot. **11**: 152 (1942)-Keng Fl. Ill. Pl. Prim. Sinic. 758 (1959).

Ranga Pani-Ghorwa, 700-300 m (Dec. 9, 1963).

Distr. Tropical regions of South-east Asia.

Neyraudia Reynaudiana (Kunth) Keng ex Hitchc. in Amer. Journ. Bot. **21**: 131 (1934)-Ohwi in Act. Phytotax. Geobot. **10**: 265 (1941)-Keng, Fl. Ill. Pl. Prim. Sinic. 339 (1959)-Bor, Grass. Ind. 518 (1960)-Bor in Dansk Bot. Arkiv **20** (2): 148 (1962)-Bor, l.c. **23** (2): 146 (1965).

Arundo Reynaudiana Kunth, Rév. Gram. **1**: 275, t. 49 (1830).

Neyraudia madagascariensis Hook. f. var. *Zollingeri* (Büse) Hook. f., Fl. Brit. Ind. **7**: 305 (1896).

Neyraudia arundinacea (L.,) Henr. var. *Zollingeri* (Büse) Henr. in Blumea **3**: 439 (1941).

Phusri-Dhara Pani, 450-900 m (Oct. 16, 1963); below Siling Tzokupa-Khebang, 2100-1700 m (Nov. 22, 1963); Tharpu-near Chyangthaphu, 1200-1100 m (Nov. 26, 1963); Dhara Pani-Illam, 1500-1200 m (Dec. 5, 1963).

Distr. E. Himalaya (Nepal), India, Burma, Thai, China, Formosa, and Malaya.

Oplismenus Burmannii (Retz.) P. Beauv., Ess. Agrost. 54, 168, 169 (1812)-Fl. Brit. Ind. **7**: 68 (1896)-Jansen in Reinwardtia **2** (2): 312 (1955)-Bor, Grass. Ind. 317 (1960)-Bor, in Dansk Bot. Arkiv **20** (2): 161 (1962).

Panicum Burmannii Retz., Obs. Bot. **3**: 10 (1783).

Kathmandu Airport, 1400 m (Oct. 13, 1963); Biratnagar, 200 m (Oct. 14, 1963); Tharpu, 1200 m (Nov. 26, 1963).

Distr. Widely distributed in the tropics of both hemispheres.

Oplismenus compositus (L.) P. Beauv., Ess. Agrost. 54, 168, 169 (1812)-Fl. Brit. Ind. **7**: 66 (1896)-Ohwi in Act. Phytotax. Geobot. **11**: 35 (1942)-Reeder in Journ. Arn. Arb. **29**: 279 (1948)-Jansen in Reinwardtia **2** (2): 311 (1953)-Keng, Fl. Ill. Pl. Prim. Sinic. 670 (1959)-Bor, Grass. Ind. 317 (1960)-Bor in Dansk Bot. Arkiv **20** (2): 161 (1962)-Hsu in Taiwania no. **9**: 47 (1963)-Bor, l.c. **23** (2): 152 (1965).

Panicum compositum L., Sp. Pl. ed. 1, 57 (1753).

Palmajua-Rimbick, 2300-2200 m (May 5, 1960); Gangtok, 1650 m (Jun. 14, 1960); near Kathmandu, 1500 m (Sep. 18, 1963); Kathmandu Airport, 1400 m (Oct. 13, 1963); Phusri-Dhara Pani, 450-900 m (Oct. 16, 1963); Dhankuta, 1200 m (Oct. 19, 1963); Hati Sar-Minchin Dhap, 2700-2800 m (Oct. 28, 1963); Dumhan-Taplejung, 700-2000 m (Nov. 1, 1963); Taplethok-Helok, 1300-1500 m (Nov. 6, 1963); below Siling Tzokupa-Khebang, 2100-1700 m (Nov. 22, 1963); Yektin, 1100 m (Nov. 29, 1963); Illam-Ranga Pani, 1200-700 m (Dec. 8, 1963); Ranga Pani-Ghorwa, 700-300 m (Dec. 9, 1963); Ghorwa-Sanichare, 300-200 m (Dec. 10, 1963).

Distr. Tropical regions of the world.

Oryza sativa L., Sp. Pl. ed. 1, 333 (1753)–Fl. Brit. Ind. **7**: 92 (1896)–Ohwi in Journ. Jap. Bot. **17**: 491 (1941)–Keng, Fl. Ill. Pl. Prim. Sinic. 629 (1959)–Bor, Grass. Ind. 605 (1960).

Mul Pokhari–Dumhan, 2400–700 m (Oct. 30, 1963); Tharpu, 1200 m (Nov. 26, 1963); Ranga Pani–Ghorwa, 700–300 m (Dec. 9, 1963); Ghorwa–Sanichare, 300–200 m (Dec. 10, 1963); Sanichare–Sibganja, 200 m (Dec. 11, 1963); Sibganja–Gauriganja, 200 m (Dec. 12, 1963); Kathgara–Rangali, 200 m (Dec. 14, 1963).

Distr. Cultivated in tropics, and extending to temperate regions.

Panicum notatum Retz., Obs. Bot. **4**: 18 (1786)–Bor, Grass. Ind. 701 (1960)–Bor in Dansk Bot. Arkiv **20** (2): 162 (1962)–Hsu in Journ. Jap. Bot. **38**: 85 (1963)–Bor, l.c. **23** (2): 153 (1965).

Panicum montanum Roxb., Fl. Ind. ed. Carey **1**: 315 (1820)–Fl. Brit. Ind. **7**: 53 (1896)–Jansen in Reinwardtia **2** (2): 316 (1953)–Bor, Grass. Ind. 329 (1960).

Panicum cordatum Büse in Miq. Pl. Junghun. 376 (1854)–Merr., Enum. Philip. Fl. Pl. **1**: 63 (1922)–Ohwi in Act. Phytotax. Geobot. **11**: 45 (1942)–Keng, Fl. Ill. Pl. Prim. Sinic. 649 (1960).

Dhara Pani–Tamur Bridge, 900–300 m (Oct. 17, 1963); Tharpu–near Chyangthaphu, 1200–1100 m (Nov. 26, 1963); Ranga Pani–Ghorwa, 700–300 m (Dec. 9, 1963).

Distr. Himalaya (Nepal), India, Ceylon, Burma, Thai, S. China (Hainan, Kwangtung, Kwangsi), Formosa, Philippines, Malaysia, and Java.

Panicum paludosum Roxb., Fl. Ind. ed. Carey, **1**: 310 (1820)–Reeder in Journ. Arn. Arb. **29**: 268 (1948)–Keng, Fl. Ill. Pl. Prim. Sinic. 652 (1959)–Bor, Grass. Ind. 329 (1960)–Bor in Dansk Bot. Arkiv **20** (2): 163 (1962)–Hsu in Journ. Jap. Bot. **38**: 83 (1963).

Panicum proliferum Lamk. sensu Hook. f., Fl. Brit. Ind. **7**: 50 (1896).

Nissim–Dumhan, 1500–700 m (Oct. 30, 1963).

Distr. E. Himalaya (Nepal), India, Thai, S. China (Kwangtung, Fokien), Formosa, Malaysia, and extending to Australia.

Panicum psilopodium Trin., Gram. Panic. 217 (1826)–Fl. Brit. Ind. **7**: 46 (1896)–Ohwi in Act. Phytotax. Geobot. **11**: 46 (1942)–Keng, Fl. Ill. Pl. Prim. Sinic. 657 (1959)–Bor, Grass. Ind. 329 (1960)–Hsu in Journ. Jap. Bot. **38**: 84 (1963).

Kathmandu Airport, 1400 m (Oct. 13, 1963).

Distr. Himalaya (Nepal), India, Ceylon, Burma, China (Hainan, Kwangtung, Yunnan, Chekiang, Kiangsu, Shantung), Formosa, Philippines, and Malaysia.

Panicum trypheron Schult., Syst. Veg. Mant **2**: 244 (1824)–Fl. Brit. Ind. **7**: 47 (1896)–Ohwi in Act. Phytotax. Geobot. **11**: 46 (1942)–Keng, Fl. Ill. Pl. Prim. Sinic. 652 (1959)–Bor, Grass. Ind. 331 (1960)–Bor in Dansk Bot. Arkiv **20** (2): 163 (1962).

Panicum suishaense Hayata, Icon. Fl. Formos. **7**: 62 (1918)–Jansen in Reinwardtia **2** (2): 318 (1953).

Panicum trypheron Schult. var. *suishaensis* (Hay.) Hsu in Journ. Jap. Bot. **38**: 84 (1963).

Dumhan, Taplejung Dist., by the Tamur River, 700 m (Oct. 31, 1963).

Distr. Tropical Africa, E. Himalaya (Nepal), India, Thai, S. China (Hainan, Kwangsi, Kwangtung), Formosa, and Malaysia.

Panicum walense Mez in Engl. Bot. Jahrb. **34**: 146 (1904), ut *watense*–Clayton in Kew Bull. **20**: 264 (1966).

Panicum humile Nees ex Steud., Syn. Pl. Glum. **1**: 84 (1854)–Fl. Brit. Ind. **7**: 48 (1896); non Thunb. ex Trin. 1826.

Panicum austro-asiaticum Ohwi in Act. Phytotax. Geobot. **11**: 45 (1942)–Jansen in Reinwardtia **2** (2): 314 (1953)–Keng, Fl. Ill. Pl. Prim. Sinic. 658 (1959)–Bor, Grass. Ind. 324 (1960)–Bor in Dansk Bot. Arkiv **20** (2): 162 (1962)–Hsu in Journ. Jap. Bot. **38**: 79 (1963).

Phusri–Dhara Pani, 450–900 m (Oct. 16, 1963); Dumhan, Taplejung Dist., by the Tamur River, 900 m (Oct. 31, 1963); Dumhan–Taplejung, 700–2000 m (Nov. 1, 1963); Bharomdin–Tharpu, 1000–1200 m (Nov. 25, 1963).

Distr. North Tropical Africa, E. Himalaya (Nepal), India, Ceylon, Thai, S. China (Hainan, Kwangtung), Formosa, and Malaysia.

Paspalum Commersonii Lamk., Encycl. **1**: 175, t. 43, f. 1 (1791)–Jansen in Reinwardtia **2** (2): 319 (1953)–Bor, Grass. Ind. 335, f. 38 (1960)–Hsu in Taiwania no. **9**: 51 (1963)–Bor in Dansk Bot. Arkiv **20** (2): 163 (1962)–Bor, l.c. **23** (2): 153 (1965).

Paspalum scrobiculatum L. var. *Commersonii* (Lamk.) Stapf in Prain, Fl. Trop. Afr. **9**: 573 (1919).

Mul Pokhari–Dumhan, 2400–700 m (Oct. 30, 1963); Dumhan, 700 m (Oct. 31, 1963); Taplejung, 1700 m (Nov. 2, 1963); Bharomdin–Tharpu, 1000–1200 m (Nov. 25, 1963).

Distr. Tropical and subtropical regions of the Old World.

Paspalum conjugatum Berg. in Act. Helv. Phys. Math. **7**: 129, t. 8 (1772)–Fl. Brit. Ind. **7**: 11 (1896)–Ohwi in Act. Phytotax. Geobot. **11**: 40 (1942)–Reeder in Journ. Arn. Arb. **29**: 297 (1948)–Keng, Fl. Ill. Pl. Prim. Sinic. 687 (1959)–Bor, Grass. Ind. 336 (1960)–Bor in Dansk Bot. Arkiv **20** (2): 164 (1962)–Hsu in Taiwania no. **9**: 52 (1963)–Bor, l.c. **23** (2): 154 (1965).

Rangpo–Tista Bazar, 350–300 m (Jun. 18, 1960); Ranga Pani–Ghorwa, 700–300 m (Dec. 9, 1963).

Distr. Common in the tropics of the Old World, also found in warmer parts of America, and Africa.

Paspalum distichum L., Syst. Nat. ed. 10, **2**: 855 (1759)–Fl. Brit. Ind. **7**: 12 (1896)–Ohwi in Act. Phytotax. Geobot. **11**: 39 (1942)–Jansen in Reinwardtia **2** (2): 321 (1953)–Keng, Fl. Ill. Pl. Prim. Sinic. 688 (1959)–Bor, Grass. Ind. 338 (1960)–Hsu in Taiwania no. **9**: 52 (1963)–Ohwi in Journ. Coll. Arts Sci. Chiba **4**: 317 (1965).

Kathmandu Airport, 1400 m (Oct. 13, 1963); Biratnagar, 200 m (Oct. 15, 1963); Dhara Pani–Tamur Bridge, 900–300 m (Oct. 17, 1963).

Distr. Tropical and subtropical regions of the world, rather rare in Malaysia.

Paspalum longifolium Roxb., Fl. Ind. ed. Carey, **1**: 283 (1820)–Ohwi in Act. Phytotax. Geobot. **11**: 41 (1942)–Keng. Fl. Ill. Pl. Prim. Sinic. 687 (1959)–Bor, Grass. Ind. 339 (1960)–Bor in Dansk Bot. Arkiv **20** (2): 164 (1962)–Bor, l.c. **23** (2): 154 (1965).

Paspalum scrobiculatum L. var. *philippinense* Merr. in Philip. Journ. Sci. **1**, Suppl.: 345 (1906).

Paspalum scrobiculatum L. var. *longifolium* (Roxb.) Domin in Bibl. Bot. **85**: 287 (1915).

Sinduwa, Dhankuta Dist., 2100 m (Oct. 23, 1963); Ranga Pani–Ghorwa, 700–300 m (Dec. 9, 1963).

Distr. E. Himalaya (Nepal), Assam, India, Thai, S. China (Kwangsi, Hainan), Formosa, Malaysia, and north Australia.

Paspalum orbiculare G. Forst., Fl. Insul. Austr. Prodr. **7** (1786)–Reeder in Journ. Arn. Arb. **29**: 299 (1948)–Keng, Fl. Ill. Pl. Prim. Sinic. 686 (1959)–Bor, Grass. Ind. 340 (1960)–Bor in Dansk Bot. Arkiv **20** (2): 164 (1962)–Hsu in Taiwania no. **9**: 52 (1963).

Paspalum scrobiculatum L. var. *orbiculare* (Forst.) Hack. in Engl., Bot. Jahrb. **6**: 233 (1884)–Ohwi in Act. Phytotax. Geobot. **11**: 41 (1942).

Rayang, 250 m (Apr. 20, 1960); Rangpo–Tista Bazar, 350–300 m (Jun. 18, 1960).

Distr. Southeast Asia, extending to Polynesia, and Australia.

Paspalum scrobiculatum L., Mant. Pl. **1**: 29 (1767)–Fl. Brit. Ind. **7**: 10 (1896)–Henr. in Blumea **3**: 439 (1940)–Ohwi in Act. Phytotax. Geobot. **11**: 40 (1942)–Reeder in Journ. Arn. Arb. **29**: 298 (1948)–Keng, Fl. Ill. Pl. Prim. Sinic. 685 (1959)–Bor, Grass. Ind. 340 (1960)–Bor in Dansk Bot. Arkiv **20** (2): 164 (1962).

Taplejung–Garhi Danra, 2000–2200 m (Nov. 3, 1963); Kathgara–Rangali, 200 m (Dec. 14, 1963).

Distr. Tropical regions of the Old World.

Pennisetum polystachyon (L.) Schult., Syst. Veg. **2**: 146 (1824)–Bor, Grass. Ind. 346 (1960).

Panicum polystachyon L., Syst. Nat. ed. 10, **2**: 870 (1759).

Tamur Bridge–Dhankuta, 300–1200 m (Oct. 17, 1963).

Distr. Tropical regions of the Old World.

Perotis hordeiformis Nees apud Hook. et Arn., Bot. Beech. Voy. 247, 248 (1838)–Bor, Grass. Ind. 611 (1960)–Bor in Dansk Bot. Arkiv **20** (2): 152 (1962).

Phusri–Dhara Pani, 450–900 m (Oct. 16, 1963); Dhara Pani–Tamur Bridge, 900–300 m (Oct. 17, 1963).

Distr. E. Himalaya (Nepal), India, Ceylon, Burma, Thai, Southeast Asia to Malaya, and east to Formosa.

This is a sand-loving grass. It has well developed root system and fairly long stolons. In Formosa, it is found only on sand dune of the southern part of the Island.

Poa Aitchisonii Boiss., Fl. Orient. **5**: 602 (1884)–Bor, Grass. Ind. 554 (1960).

Jongri–Olothang, 4000–3900 m (May 23, 1960).

Distr. E. Himalaya (Sikkim), NW. India, and Afghanistan.

Poa annua L., Sp. Pl. ed. 1, 68 (1753)–Fl. Brit. Ind. **7**: 345 (1896)–Ohwi in Act. Phytotax. Geobot. **10**: 120 (1941)–Jansen in Reinwardtia **2** (2): 322 (1953)–Keng, Fl. Ill. Pl. Prim. Sinic. 224 (1959)–Bor, Grass. Ind. 555 (1960)–Ohwi in Journ. Coll. Arts Sci. Chiba **4**: 317 (1965).

Gangtok, 1650 m (Apr. 26, 1960); Chia Bhanjang, 3000 m (May 11, 1960); Migothang, 3900 m (May 31, 1960); Chia Bhanjang–Phalut, 3100–3500 m (Jun. 2, 1960);

Dhankuta, 1200 m (Oct. 20, 1963); Helok-Boroya Khimty, 1500-2500 m (Nov. 15, 1963); Bhuspate Danra-Mai Majuwa, 2900-1600 m (Dec. 3, 1963).

Distr. Cosmopolitan.

Poa khasiana Stapf in Hook. f., Fl. Brit. Ind. **7**: 343 (1896)-Bor, Grass. Ind. 557 (1960).

Chia Bhanjang-Phalut, 3100-3500 m (Jun. 2, 1960); Garibans-Tonglu, 2800-3000 m (Jun. 7, 1960).

Distr. E. Himalaya (Sikkim), and Assam.

Poa lahulensis Bor in Kew Bull. **1948**: 138 (1948)-Bor, Grass. Ind. 558 (1960).

Jongri-Olothang, 4100-3900 m (May 23, 1960).

Distr. Himalaya (Kashmir, Kunawar, Sikkim).

Poa ludens Stewart in Brittonia **5**: 420 (1945)-Bor, Grass. Ind. 558 (1960).

Poa pseudopratensis sensu Hook. f., Fl. Brit. Ind. **7**: 340 (1896).

Gamothang-Migothang, 3900-3500 m (May 30, 1960).

Distr. E. Himalaya (Sikkim, Bhutan), and South Tibet.

Poa pogophila Bor in Kew Bull. **1949**: 239 (1949)-Bor, Grass. Ind. 558 (1960)-Ohwi, l.c. **4**: 317 (1965).

Poa flexuosa sensu Hook. f., Fl. Brit. Ind. **7**: 342 (1896).

Gamothang, 3800 m (May 29, 1960).

Distr. Mainly in East Himalaya.

Poa sikkimensis (Stapf) Bor in Kew Bull. **1952**: 130 (1952)-Keng, Fl. Ill. Pl. Prim. Sinic. 221 (1959)-Bor, Grass. Ind. 560 (1960).

Poa annua L. var. *sikkimensis* Stapf in Hook. f., Fl. Brit. Ind. **7**: 346 (1896).

Phalut, 3300-3600 m (Jun. 2, 1960).

Distr. E. Himalaya (Sikkim), Tibet, and W. China (Szechuan).

Poa Stewartiana Bor in Kew Bull. **1951**: 185 (1951)-Bor, Grass. Ind. 561 (1960).

Migothang-Nayathang, 3900-3300 m (Jun. 1, 1960); Phalut, 3500 m (Jun. 5, 1960).

Distr. Himalaya (Kashmir to Sikkim).

Poa supina Schrad., Fl. Germ. **1**: 289 (1806)-Bor, Grass. Ind. 561 (1960).

Phalut, 3500 m (Jun. 5, 1960).

Distr. From Western Europe to Himalaya, and Russia.

Pogonatherum crinitum (Thunb.) Kunth, Enum. Pl. **1**: 478 (1833)-Fl. Brit. Ind. **7**: 141 (1896)-Ohwi in Act. Phytotax. Geobot. **11**: 159 (1942)-Keng, Fl. Ill. Pl. Prim. Sinic. 786 (1959)-Bor, Grass. Ind. 200 (1960)-Bor in Dansk Bot. Arkiv **20** (2): 175 (1962).

Andropogon crinitus Thunb., Fl. Jap. 40, t. 7 (1784).

Below Siling Tzokupa-Khebang, 2100-1700 m (Nov. 22, 1963); Khebang-Bharomdin 1700-1000 m (Nov. 24, 1963); near Chyangthaphu-Birwa, 1100-2400 m (Nov. 27, 1963).

Distr. E. Himalaya (Nepal, Sikkim), India, Thai, Indo-China, China, Japan, and Malaysia.

Pogonatherum paniceum (Lamk.) Hack. in Allg. Bot. Zeits. **12**: 178 (1906)-Reeder in Journ. Arn. Arb. **29**: 339 (1948)-Jansen in Reinwardtia **2** (2): 333 (1953)-Keng, Fl. Ill. Pl. Prim. Sinic. 786 (1959)-Bor, Grass. Ind. 202 (1960)-Bor in Dansk Bot. Arkiv **23** (2): 164 (1965).

Saccharum paniceum Lamk., Encycl. Méth. **1**: 595 (1785); Tab. Encycl. **1**: 155,

t. 40, f. 3 (1791).

Pogonatherum saccharoideum P. Beauv., Ess. Agrost. 176, 177 (1812)–Fl. Brit. Ind. **7**: 141 (1896).

Saramsa, 1200 m (Mar. 21, 1963); Siliguri–Kurseong (Apr. 29, 1960); Tista Bazar, 300 m (Jun. 19, 1960); Darjeeling, 2150 m (Jun. 21, 1960); Rimbick (May 5, 1960); Happy Valley (Jun. 26, 1960); Kathmandu Airport, 1400 m (Oct. 13, 1963); Khebang–Bharomdin, 1700–1000 m (Nov. 24, 1963); Bharomdin–Tharpu, 1000–1200 m (Nov. 25, 1963); Tharpu–Chyangthaphu, 1200–1100 m (Nov. 26, 1963).

Distr. E. Himalaya (Nepal, Sikkim), India, Ceylon, Burma, Thai, Indo-China, W. China (Yunnan, Szechuan, Kwangtung), Formosa, and Malaysia.

This species differs form *P. crinitum* in having anthers 1.5 mm long, and longer spikelets which are 2.5–3 mm long. The culms are more or less woody and much branched in this species.

Polypogon fugax Nees ex Steud., Syn. Pl. Glum. **1**: 184 (1854)–Ohwi in Bot. Mag. Tokyo **55**: 357 (1941)–Bor, Grass. Ind. 403 (1960)–Ohwi in Journ. Coll. Arts Sci. Chiba **4**: 317 (1965).

Polypogon Higegaweri Steud., Syn. Pl. Glum. **1**: 422 (1855)–Keng, Fl. Ill. Pl. Prim. Sinic. 553 (1959).

Polypogon littoralis Sm. var. *Higegawari* Hook. f., Fl. Brit. Ind. **7**: 246 (1896).

Pamianchi–Tingling Bridge, 2000–1000 m (May 15, 1960); Yoksam, 1800 m (May 17, 1960); Kalimpong, 1350 m (Jun. 20, 1960).

Distr. All along Himalaya, Assam, Bhutan, China, Korea, and Japan.

Pseudopogonatherum contortum (Brongn.) A. Camus in Fl. Gén. Indo-Chin. **7**: 255 (1922)–Bor, Grass. Ind. 204 (1960).

Pogonatherum contortum Brongn. in Duperr., Voy. Coq. Bot. **90**: 17 (1831).

Pollinia articulata Trin. in Mém. Acad. Sci. Pétersb. sér. 6, **2**: 273 (1832)–Fl. Brit. Ind. **7**: 109 (1896).

Eulalia contorta (Brongn.) O. Kuntze, Rev. Gen. Pl. **2**: 775 (1891)–Keng, Fl. Ill. Pl. Prim. Sinic. 782 (1959).

Phusri–Dhara Pani, 450–900 m (Oct. 16, 1963); Dhankuta, 1200 m (Oct. 19, 1963); Mahara Bahara–Kathgara, 200 m (Dec. 13, 1963).

Distr. E. Himalaya (Nepal), India, Burma, Indo-China, China (Yunnan, Kwangsi, Kwangtung, Fokien), and Malaysia, extending to Australia.

Pseudechinolaena polystachya (HBK) Stapf in Prain, Fl. Trop. Afr. **9**: 495 (1919)–Keng, Fl. Ill. Pl. Prim. Sinic. 669 (1959)–Bor, Grass. Ind. 352 (1960)–Bor in Dansk Bot. Arkiv **23** (2): 154 (1965).

Echinolaena polystachya HBK, Nov. Gen. et Sp. **1**: 119 (1816).

Panicum uncinatum Raddi, Agrost. Bras. 41 (1823)–Fl. Brit. Ind. **7**: 58 (1896).

Tuwa–Taplethok, 1800–1300 m (Nov. 5, 1963); Yektin–Akasay, 1400–2300 m (Nov. 30, 1963).

Distr. E. Himalaya (Nepal), Assam, India, Ceylon, China (Yunnan, Kwangtung, Fokien), tropical regions of both hemispheres.

Saccharum spontaneum L., Mant. Pl. **2**: 183 (1771)–Fl. Brit. Ind. **7**: 118 (1896)–Ohwi in Act. Phytotax. Geobot. **11**: 151 (1942)–Keng, Fl. Ill. Pl. Prim. Sinic. 762 (1959)–Bor, Grass. Ind. 214 (1960)–Bor in Dansk Bot. Arkiv **20** (2): 176 (1962).

Godavari, south of Kathmandu, 1600 m (Sep. 18, 1963); Gokarna Forest, Northwest of Kathmandu, 1500 m (Sep. 22, 1963); Biratnagar, 200 m (Oct. 14, 1963); Phusri-Dhara Pani, 450–900 m (Oct. 16, 1963); Rangali-Biratnagar, 200 m (Dec. 15, 1963).

Distr. The warmer regions of the Old World.

The fertile lemma is reduced, lodicule-like, but veined and sharply divided, the degree of reduction varies in the different specimens and even in different spikelets in the same panicle.

Judging from the cytological view point, Moriya (1956) suggested to separate the Formosan and Japanese (including Ryukyu) clones from the neighbouring areas. The Philippines clones have 2n=80, while the clones in Java with 2n=112. They are all robust in habit, more than three meters high, and they flower between February and March. It is said true also in Hainan and Celebes.

Sacciolepis indica (L.) A. Chase in Proc. Biol. Soc. Wash. **21**: 8 (1908)–Ohwi in Act. Phytotax. Geobot. **11**: 48 (1942)–Reeder in Journ. Arn. Arb. **29**: 282 (1948)–Keng, Fl. Ill. Pl. Prim. Sinic. 662 (1959)–Bor, Grass. Ind. 357 (1960)–Bor in Dansk Bot. Arkiv **20** (2): 165 (1962)–Hsu in Taiwania no. **9**: 54 (1963).

Aira indica L., Sp. Pl. ed. 1, in "Errata" (1753).

Panicum indicum Linn., Mant. Pl. **2**: 184 (1771)–Fl. Brit. Ind. **7**: 41 (1896).

Rayang, 250 m (Apr. 20, 1960); Gangtok, 1650 m (Jun. 13, 1960); Rangpo–Tista Bazar, 350–300 m (Jun. 18, 1960); Tista Bazar, 300 m (Jun. 20, 1960); Kalimpong, 1350 m (Jun. 20, 1960); Phusri–Dhara Pani, 450–900 m (Oct. 16, 1963); Dhankuta, 1200 m (Oct. 19, 1963); Nissim–Dumhan, 1500–700 m (Oct. 30, 1963); Dumhan, 700 m (Oct. 31, 1963); Dumhan–Taplejung, 700–2000 m (Nov. 1, 1963); Taplejung–Garhi Danra, 2000–2200 m (Nov. 3, 1963); Iladanda–Helok, 1800–1500 m (Nov. 13, 1963); Khebang, 1400 m (Nov. 23, 1963); Dhara Pani–Illam, 1500–1200 m (Dec. 5, 1963); Sibganja–Gauriganja, 200 m (Dec. 12, 1963).

Distr. E. Himalaya (Nepal, Sikkim), India, Southeast Asia, Polynesia to Australia.

Sacciolepis interrupta (Willd.) Stapf in Prain, Fl. Trop. Afr. **9**: 757 (1920)–Bor, Grass. Ind. 358 (1960).

Panicum interruptum Willd., Sp. Pl. **1**: 341 (1798)–Fl. Brit. Ind. **7**: 40 (1896).

Sibganja–Gauriganja, 200 m (Dec. 12, 1963); Sibganja–Mahara Bahara, 200 m (Dec. 12, 1963); Mahara Bahara–Kathgara, 200 m (Dec. 13, 1963); Kathgara–Rangali, 200 m (Dec. 14, 1963).

Distr. E. Himalaya (Nepal), India, Ceylon, Burma, and Malaysia.

Schizachyrium brevifolium (Sw.) Nees ex Büse in Miquel, Pl. Junghn. 359 (1854)–Jansen in Reinwardtia **2** (2): 336 (1953)–Keng, Fl. Ill. Pl. Prim. Sinic. 841 (1959)–Bor, Grass. Ind. 215 (1960)–Bor in Dansk Bot. Arkiv **20** (2): 176 (1962); l.c. **23** (2): 165 (1965).

Andropogon brevifolius Sw., Prodr. Veg. Ind. Occ. 26 (1788)–Fl. Brit. Ind. **7**: 165 (1896)–Ohwi in Act. Phytotax. Geobot. **11**: 169 (1942)–Reeder in Journ. Arn. Arb. **29**: 363 (1948).

Phusri–Dhara Pani, 450–900 m (Oct. 16, 1963); Dhankuta, 1200 m (Oct. 19, 1963); Nissim–Dumhan, 1500–700 m (Oct. 30, 1963); Dumhan, 700 m (Oct. 31, 1963); Dumhan–Taplejung, 700–2000 m (Nov. 1, 1963); Khebang, 1400 m (Nov. 23, 1963); Bharomdin–Tharpu, 1000–1200 m (Nov. 25, 1963).

Distr. Tropics of the Old World.

This is a weak annual grass usually found in shady places along streams or rocky slopes. The presence of awn is variable. It resembles *S. fragile*, but the oblong-shaped leaves are suddenly obtuse at the apex and the peduncles of the racemes are longer than the spathe at maturity. While in *S. fragile* the leaf apex is acute and the peduncle is much shorter than the spathe after flowering. Further differences may be seen in glabrous pedicels, not robust habit of plant body in the species.

Setaria Forbesiana (Nees ex Steud.) Hook. f., Fl. Brit. Ind. **7**: 81 (1896)-Keng, Fl. Ill. Pl. Prim. Sinic. 707 (1959)-Bor, Grass. Ind. 360 (1960)-Ohwi in Journ. Coll. Arts Sci. Chiba **4**: 317 (1965).

Panicum Forbesiana Nees ex Steud., Syn. Pl. Glum. **1**: 98 (1854).

Kathmandu Airport, 1400 m (Oct. 13, 1963).

Distr. E. Himalaya (Nepal), Assam, India, Burma to China (Kweichow, Szechuan, Kwangsi, Yunnan).

Setaria geniculata (Lamk.) P. Beauv., Ess. Agrost. 51, 169, 178 (1812)-Ohwi in Act. Phytotax. Geobot. **11**: 53 (1942)-Keng, Fl. Ill. Pl. Prim. Sinic. 712 (1959)-Bor, Grass. Ind. 360 (1960)-Hsu in Taiwania no. **9**: 55 (1963).

Panicum geniculatum Lamk., Encycl. Méth. **4**: 727 (1798).

Happy Valley (Jun. 26, 1960); Kathmandu, 1400 m (Sep. 17, 1963); Chobar Gorge, south of Kathmandu, 1200 m (Sep. 21, 1963); Kathmandu Airport, 1400 m (Oct. 13, 1963); Dhara Pani–Tamur Bridge, 900–300 m (Oct. 17, 1963); Dhankuta, 1200 m (Oct. 19, 1963); Bilbatay Bhanjang–Hati Sar, 2200–2700 m (Oct. 27, 1963); Gorzu Kosir–Nissim, 2100–1500 m (Oct. 30, 1963); Dumhan, 700 m (Oct. 31, 1963); Dumhan–Taplejung, 700–2000 m (Nov. 1, 1963); Helok–Baroya Khimty, 1500–2500 m (Nov. 15, 1963).

Distr. Tropics and subtropics of America, introduced into warmer countries.

Setaria pallide-fusca (Schumach.) Stapf et C. E. Hubb. in Kew Bull. **1930**: 259 (1930)-Reeder in Journ. Arn. Arb. **29**: 303 (1948)-Jansen in Reinwardtia **2** (2): 339 (1953)-Bor, Grass. Ind. 363 (1960)-Bor in Dansk Bot. Arkiv **20** (2): 165 (1962)-Hsu in Taiwania no. **9**: 56 (1963)-Bor, l.c. **23** (2): 155 (1965)-Ohwi, l.c. **4**: 318 (1965).

Panicum pallide-fuscum Schumach., Beskr. Guin. Pl. 58 (1827).

Gangtok, 1650 m (Jun. 13, 1960); Phusri–Dhara Pani (Oct. 16, 1963).

Distr. Tropics of the Old World.

Setaria palmifolia (Koen.) Stapf in Journ. Linn. Soc. **42**: 186 (1914)-Ohwi in Act. Phytotax. Geobot. **11**: 49 (1942)-Reeder in Journ. Arn. Arb. **29**: 301 (1948)-Keng, Fl. Ill. Pl. Prim. Sinic. 705 (1959)-Bor, Grass. Ind. 363 (1960)-Bor in Dansk Bot. Arkiv **20** (2): 166 (1962)-Hsu in Taiwania no. **9**: 56 (1963).

Panicum palmaefolium Koenig in Naturf. **23**: 208 (1788).

Panicum plicatum Willd., Enum. Pl. 1033 (1809), non Lamk. (1797)-Fl. Brit. Ind. **7**: 55 (1896).

Taplejung, 1700 m (Nov. 2, 1963); Iladanda–Selap, 1800–2600 m (Nov. 9, 1963); Mai Majuwa–Dhara Pani, 1600–1500 m (Dec. 4, 1963); Ghorwa–Sanichare, 300–200 m (Dec. 10, 1963).

Distr. Tropics of the Old World.

Setaria plicata (Lamk.) T. Cooke, Fl. Bombay **2**: 919 (1908)–Bor, Grass. Ind. 364 (1960).

Panicum plicatum Lamk., Encycl. Méth. **4**: 736 (1798).

Panicum excurrens Trin., Sp. Gram. Icon. Ill. 1, t. 89 (1828).

Setaria excurrens (Trin.) Miq. in Ann. Mus. Bot. Lugd.-Bat. **2**: 275 (1867)–Ohwi in Act. Phytotax. Geobot. **11**: 50 (1942)–Keng, Fl. Ill. Pl. Prim. Sinic. 707 (1959).

Kathmandu, 1400 m (Sept. 17, & Oct. 13, 1963); Pouwa–Kathmandu, 1600–1400 m (Oct. 9, 1963); Dhankuta, 1200 m (Oct. 21, 1963); Bharomdin–Tharpu, 1000–1200 m (Nov. 25, 1963); Tharpu, 1200 m (Nov. 26, 1963).

Distr. E. Himalaya (Nepal, Sikkim), Assam, S. W. China, Formosa, Ryukyu, and Celebes.

Setaria verticillata (L.) P. Beauv., Ess. Agrost. 51, 178 (1812)–Fl. Brit. Ind. **7**: 80 (1896)–Henr. in Blumea **3**: 412 (1940)–Ohwi in Act. Phytotax. Geobot. **11**: 50 (1942)–Bor, Grass. Ind. 365 (1960)–Bor in Dansk Bot. Arkiv **23** (2): 155 (1965).

Panicum verticillata L., Sp. Pl. ed. 2, 82 (1762).

Dhara Pani–Dhankuta, 900–1200 m (Oct. 17, 1963).

Distr. Tropics and temperate regions of the Old World.

Sporobolus diander (Retz.) P. Beauv., Ess. Agrost. 26, 147, 178 (1812)–Fl. Brit. Ind. **7**: 247 (1896)–Ohwi in Bot. Mag. Tokyo **55**: 394 (1941)–Keng, Fl. Ill. Pl. Prim. Sinic. 567 (1959)–Bor, Grass. Ind. 629 (1960)–Bor in Dansk Bot. Arkiv **20** (2): 152 (1962).

Agrostis diandra Retz., Obs. Bot. **5**: 19 (1789).

Gangtok, 1600 m (Jun. 13, 1963); Kalimpong, 1300 m (Jun. 19, 1960); Kathmandu Airport, 1400 m (Oct. 13, 1963); Phusri–Dhara Pani, 450–900 m (Oct. 16, 1963); Dhankuta, 1200 m (Oct. 21, 1963).

Distr. E. Himalaya (Nepal, Sikkim), India, Ceylon, Burma, Thai, China (Kwangtung, Fokien, Hainan, Kwangsi, Yunnan), Formosa, Malaysia to Australia.

Sporobolus fertilis (Steud.) W. D. Clayton in Kew Bull. **19**: 291 (1965).

Agrostis fertilis Steud., Syn. Pl. Glum. **1**: 170 (1854).

Sporobolus indicus R. Br. sensu Bor, Grass. Ind. 630 (1960)–Bor in Dansk Bot. Arkiv **20** (2): 152 (1962).

Palmajua–Rimbick, 2300–2200 m (May 5, 1963); Tingling Bridge–Yoksam, 1000–1700 m (May 16, 1960); Kathmandu Airport, 1400 m (Oct. 13, 1963); Dhankuta, 1200 m (Oct. 19, 1963); Tuwa–Taplethok, 1800–1300 m (Nov. 5, 1963); Khebang, 1400 m (Nov. 23, 1963); Tharpu, 1200 m (Nov. 26, 1963).

Distr. E. Himalaya, India, Ceylon, Burma, Thai, Malaysia, China, and Japan.

Sporobolus piliferus (Trin.) Kunth, Enum. Pl. **1**: 211 (1833)–Fl. Brit. Ind. **7**: 251 (1896)–Bor, Grass. Ind. 632 (1960).

Vilfa pilifera Trin., Diss. Bot. 157 (1824).

Phusri–Dhara Pani, 450–900 m (Oct. 16, 1963); Dhankuta, 1200 m (Oct. 21, 1963); Dhankuta–Sinduwa, 1200–2000 m (Oct. 22, 1963); Taplejung, 1700 m (Nov. 2, 1963); Garhi Danra–Tuwa, 2200–1800 m (Nov. 4, 1963); Helok, 1500 m (Nov. 7, 1963); Tharpu–near Chyangthaphu, 1200–1100 m (Nov. 26, 1963).

Distr. E. Himalaya (Nepal), Assam, India, Ceylon, and East Africa.

Stipa Roylei (Nees) Mez in Fedde, Rep. **17**: 207 (1921)–Bor, Grass. Ind. 646 (1960).

Orthoraphium Roylei Nees in Proc. Linn. Soc. **1**: 94 (1841).

Stipa orthoraphium Steud., Syn. Pl. Glum. **1**: 131 (1854)–Fl. Brit. Ind. **7**: 233 (1896).

Murhay–Bilbatay Bhanjang, 2000–2100 m (Oct. 24, 1963); Minchin Dhap–Mul Pokhari, near Taplejung, 2800–2400 m (Oct. 29, 1963).

Distr. Temperate Himalaya, and Assam.

Themeda caudata (Nees) A. Camus in Fl. Gén. Indo-Chin. **7**: 364 (1922)–Ohwi in Act. Phytotax. Geobot. **11**: 170 (1940)–Bor, Grass. Ind. 250 (1960).

Anthistiria caudata Nees in Hook. et Arn., Bot. Beechey Voy. 245 (1838).

Themeda gigantea Hack. subsp. *caudate* (Nees) Hack. in DC., Monogr. Phan. **6**: 676 (1889) p.p.–Fl. Brit. Ind. **7**: 217 (1896).

Pamianchi–Tingling Bridge, 2000–1000 m (May 15, 1960); Ranga Pani, 700 m (Dec. 9, 1963).

Distr. E. Himalaya (Nepal, Sikkim), North India, Burma, Indo-China, and China.

Themeda Hookeri (Griseb.) A. Camus in Bull. Mus. Hist. Nat. Paris **26**: 425 (1920)–Keng, Fl. Ill. Pl. Prim. Sinic. 846 (1959)–Bor, Grass. Ind. 251 (1960).

Anthistiria Hookeri Griseb. in Goett. Nachr. 91 (1868)–Fl. Brit. Ind. **7**: 216 (1896).

Baroya Khimty–Thakma Khola, 2500–3100 m (Nov. 12, 1963).

Distr. E. Himalaya (Nepal, Sikkim), and W. China (Yunnan, Sikang).

Themeda villosa (Poir.) A. Camus in Fl. Gén. Indo-Chin. **7**: 364 (1922)–Bor, Grass. Ind. 254 (1960)–Bor in Dansk Bot. Arkiv **20** (2): 166 (1965).

Anthistiria villosa Poir. in Lamk., Encycl. Méth. Suppl. **1**: 396 (1810).

Themeda gigantea (Cav.) Hack. subsp. *villosa* Hack. in DC., Monogr. Phan. **6**: 678 (1889).

Dhankuta, 1200 m (Dec. 19, 1963).

Distr. E. Himalaya (Nepal), India, Thai, Indo-China, and China.

Thysanolaena maxima (Roxb.) O. Kuntze, Rev. Gen. Pl. **2**: 794 (1891)–Ohwi in Act. Phytotax. Geobot. **10**: 272 (1940)–Keng, Fl. Ill. Pl. Prim. Sinic. 340 (1959)–Bor, Grass. Ind. 650 (1960)–Bor in Dansk Bot. Arkiv **20** (2): 153 (1962)–Bor, l.c. **23** (2): 149 (1965).

Agrostis maxima Roxb., Fl. Ind. ed. Carey, **1**: 319 (1820).

Thysanolaena Agrostis Nees in Edinb. New Philos. Journ. **18**: 180 (1835)–Fl. Brit. Ind. **7**: 61 (1896).

Takdah, 1600–1700 m (Apr. 19, 1960); Rimbick, 2200 m (May 5, 1960); Dhankuta, 1200 m (Oct. 19, & 20, 1963); Taplejung–Garhi Danra, 2000–2200 m (Nov. 3, 1963); Tuwa–Taplethok, 1800–1300 m (Nov. 5, 1963); Dhara Pani–Illam, 1500–1200 m (Dec. 5, 1963).

Distr. E. Himalaya (Nepal, Sikkim), India, Thai, Indo-China, S. W. China (Yunnan, Kweichow, Kwangsi, Kwangtung, Hainan), Formosa to New Guinea.

Tripogon trifidus Munro ex Stapf in Kew Bull. **1892**: 85 (1892)–Hook. f., Fl. Brit. Ind. **7**: 286 (1896)–Bor, Grass. Ind. 524 (1960)–Ohwi in Journ. Coll. Arts Sci. Chiba **4**: 318 (1965).

Kathmandu Airport, 1400 m (Oct. 13, 1963); Dhankuta, 1200 m (Oct. 21, 1963); Sinduwa, Dhankuta Dist., 2100 m (Oct. 23, 1963); Baroya Khimty–Thakma Khola, 2500–3100 m (Nov. 12, 1963).

Distr. E. Himalaya (Nepal, Sikkim), Assam, extending into Southeast Asia.

Triticum aestivum L., Sp. Pl. ed. 1, 85 (1753)–Keng, Fl. Ill. Pl. Prim. Sinic. 420 (1959)–Bor, Grass. Ind. 679 (1960).

Triticum vulgare Vill., Hist. Pl. Dauph. **2**: 153 (1787)–Fl. Brit. Ind. **7**: 367 (1897).

Palmajua–Rimbick, 2300–2200 m (May 5, 1960).

Distr. Cultivated in all parts of the World.

Vetiveria Lawsonii (Hook. f.) Blatt. et McCann in Journ. Bombay Nat. Hist. Soc. **32**: 409 (1928)–Bor, Grass. Ind. 258 (1960).

Andropogon Lawsonii Hook. f., Fl. Brit. Ind. **7**: 187 (1896).

Sanichare–Sibganja, 200 m (Dec. 11, 1963); Sibganja–Mahara Bahara, 200 m (Dec. 12, 1963).

Distr. E. Himalaya (Nepal), and India.

GRAMINEAE-BAMBUSOIDEAE (by Hiroshi Hara)

Arundinaria Hookeriana Munro in Trans. Linn. Soc. **26**: 29 (1868)–Gamble, Bamb. Brit. Ind. in Ann. Bot. Gard. Calcut. **7**: 17, t. 15 (1896)–Gamble in Fl. Brit. Ind. **7**: 382 (1896)–E. G. Camus, Bambus. 39, t. 24 B (1913).

Chimonobambusa Hookeriana (Munro) Nakai in Journ. Arn. Arb. **6**: 151 (1925).

Darjeeling, 2100 m (Apr. 5, 1960, fl.); Palmajua–Rimbick, cult., 1700 m (May 5, 1960); Ramam (May 8, 1960); Gangtok, 1600 m (Jun. 13, 1960, fl.); Taplejung–Garhi Danra, 1900–2200 m (Nov. 3, 1963, fr.); Birwa–Yektin, 2900–1800 m (Nov. 28, 1963); Mai Majuwa, 1800 m (Dec. 3, 1963).

Distr. E. Himalaya (Sikkim, Bhutan), and Khasia.

Arundinaria intermedia Munro in Trans. Linn. Soc. **26**: 28 (1868)–Gamble, l.c. 15, t. 14 (1896)–Fl. Brit. Ind. **7**: 381 (1896)–E. G. Camus, l.c. 39, t. 23 C (1913).

Gangtok, 1600 m (Jun. 15, 1960, fl.); Penlong La, Gangtok, 2100 m (Jun. 16, 1960).

Distr. E. Himalaya (Sikkim).

Arundinaria Maling Gamble in Kew Bull. **1912**: 139 (1912)–E. G. Camus, l.c. 31, t. 16 A (1913)–Nakai in Journ. Arn. Arb. **6**: 150 (1925)–Spring Fl. Sikkim Himal. f. 130 (1963).

A. racemosa Munro in Trans. Linn. Soc. **26**: 17 (1868), p.p.–Gamble, l.c. 9 (1896), p.p.–Fl. Brit. Ind. **7**: 379 (1896), p.p.

Kurseong, 1600 m (Apr. 10, 1960, fl.); Darjeeling, 2100 m (Apr. 10 & Jun. 21, 1960, fl.); above Bakkim, 3000 m (May 19, 1960, no. 370); Walunchung Gola–Zongi, 3800–2800 m (Nov. 11, 1963); Baroya Khimty, 2500 m (Nov. 12, 1963).

Distr. E. Himalaya (Nepal, Sikkim).

Arundinaria suberecta Munro in Trans. Linn. Soc. **26**: 32 (1868)–Gamble, l.c. 25, t. 24 (1896)–Fl. Brit. Ind. **7**: 385 (1896)–E. G. Camus, l.c. 52 (1913).

Iladanda–Helok, 1800–1500 m (Nov. 12, 1963); Yamphodin–Ghatte, 2100–1600 m (Nov. 18, 1963).

Distr. E. Himalaya (Nepal, Sikkim), and Khasia.

Dendrocalamus Hamiltonii Nees et Arn. ex Munro in Trans. Linn. Soc. **26**: 151 (1868)–Gamble, l.c. 84, t. 74 (1896)–Fl. Brit. Ind. **7**: 405 (1896)–E. G. Camus, l.c. 154, t. 86 B (1913).

Takdah–Rayang, 1600–300 m (Apr. 20, 1960, no. 2188, fl.); Taplejung–Garhi Danra, 1900–2200 m (Nov. 3, 1963, fl.); Khebang–Bharomdin, 1700–1000 m (Nov. 24, 1963, fl.).

Distr. E. Himalaya (Nepal to Bhutan), Assam, N. Burma, and Thai.

Dendrocalamus sikkimensis Gamble in Hook., Icon. Pl. t. 1770 (1888); l.c. 82, t. 72 (1896)–Fl. Brit. Ind. **7**: 405 (1896)–E. G. Camus, l.c. 156 (1913).

Yoksam, 1800 m (May 17, 1960, no. 341, fl.).

Distr. E. Himalaya (Sikkim, Bhutan), and Garo Hills.

Thamnocalamus aristatus (Gamble) E. G. Camus, Bambus. 54, t. 37 E (1913).

Arundinaria aristata Gamble, l.c. 18, t. 17 (1896)–Fl. Brit. Ind. **7**: 382 (1896).

Ramam–Phalut, 2400–3500 m (May 9, 1960, no. 167); Chia Bhanjang–Phalut, 3100–3600 m (May 11 & Jun. 2, 1960); Phalut, 3500 m (Jun. 5, 1960, no. 655); Sandakphu–Garibans, 3500–2800 m (Jun. 7, 1960, fl.); Bilbatay Bhanjang–Hati Sar, 2900–2200 m (Oct. 27, 1963); Hati Sar–Minchin Dhap, 2700–2900 m (Oct. 28, 1963); Thakma Khola–Bhandukay, 3500–2500 m (Nov. 14 & 17, 1963, fl.); Siling Tzokupa, 2500–3100 m (Nov. 21, 1963); Tendong Peak, 2750 m (Mar. 26, 1963).

Distr. E. Himalaya (Nepal to NEFA).

CYPERACEAE (by Tetsuo Koyama*)

Bulbostylis barbata (Rottb.) C. B. Clarke in Fl. Brit. Ind. **6**: 651 (1893).

Scirpus barbatus Rottboell, Descr. et Icon. Rar. Pl. 52, t. 17, f. 4 (1773).

Rangpo–Tista, 350–300 m (Jun. 18, 1960).

Distr. Cosmopolitan; warm and tropical regions of both hemispheres.

Bulbostylis densa (Wallich ex Roxb.) Hand.-Mzt. ex Karsten & Schenk, Vegetationsb. **20** (7): 16 (1930).

Scirpus densus Wallich ex Roxb., Fl. Ind. ed. Carey, **1**: 231 (1820).

Bulbostylis capillaris C. B. Clarke var. *trifida* (Kunth) C. B. Clarke in Fl. Brit. Ind. **6**: 652 (1893).

Kalimpong (Apr. 20, 1960); Jongri, 4100 m (May 22, 1960); Gangtok, 1650 m (Jun. 15, 1960); Dhankuta, 1200 m (Oct. 21, 1963); Hilay–Murhay, 1500–2000 m (Oct. 22, 1963); Sinduwa, Dhankuta District, 2100 m (Oct. 23, 1963); Chitray–Bilbatay Bhanjang, 2150–2200 m (Oct. 24, 1963); Tuwa–Taplethok, 1500–1300 m (Nov. 5, 1963); above Lelep, 2500 m (Nov. 9, 1963); Zongi–Walunchung Gola, 3000–3500 m (Nov. 10, 1963).

Distr. E. Himalaya, China, and Japan.

The range of distribution of this species shows that it belongs to the phytogeographical group, often called the Himalayan-Japanese Element. All specimens examined from the total range did not show any local infraspecific taxa. This species closely resembles North American *Bulbostylis capillaris*, from which it differs in the pattern of achene walls only (see Hara in Journ. Jap. Bot. **18**: 467, 1964). Detailed comparison between the two species may prove them conspecific.

Carex (Indicae) **baccans** Nees ex Wight, Contrib. Bot. Ind. 122 (1837)–Boott, Illustr. Carex **2**: t. 234 (1860)–Fl. Brit. Ind. **6**: 722 (1894)–Kükenthal,

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in Pfl.-reich IV-20, Ht. **38**: 258, f. 39 E-H (1909).

Mul Pokhari-Dumhan, 2400–700 m (Oct. 30, 1963); Taplejung, 1700 m (Nov. 2, 1963); Taplethok-Helok (Nov. 6, 1963); Helok, 1500 m (Nov. 7, 1963); Ghatte-Khebang, 1600-1700 m (Nov. 19, 1963); Chyangthaphu-Birwa, 1100-2400 m (Nov. 27, 1963); Tenzing Norgay Road, Darjeeling, 2100 m (Dec. 25, 1963).

Distr. E. Himalaya, Assam, peninsular India, Ceylon, Indo-China, Malaysia, Hainan, and Formosa.

This species when in fruit can be recognized at once by its utricles that are bright red-purple and becoming slightly fleshy at maturity, a rare occurrence in the genus *Carex*.

Carex (Capitellatae) **capillacea** Boott, Illustr. Carex **1**: 44, t. 110 (1858)-Fl. Brit. Ind. **6**: 713 (1894).

C. rara Boott subsp. *capillacea* (Boott) Kükenthal, l.c. 102 (1909).

Sandakphu-Garibans, 2800-3000 m (Jun 7, 1960).

Distr. E. Himalaya (Nepal to Bhutan), Malaysia, Australia, C. China, S. Manchuria, and Japan.

No remarkable difference was seen between the Himalayan and the Far Eastern plants of this species.

Carex (Indicae) **cruciata** Wahlenb. in Vet.-Akad. Nya Handl. Stokh. **24**: 149 (1803)-Boott, Illustr. Carex **3**: tt. 247-249 (1862)-Fl. Brit. Ind. **6**: 715 (1894)-Kükenthal, l.c. 265 (1909).

C. condensata Nees ex Wight, Contrib. Bot. Ind. 123 (1834)-Fl. Brit. Ind. **6**: 716 (1894).

Butia Basti, Darjeeling, 2000 m (Apr. 6, 1960); Taplejung, 1700 m (Nov. 2, 1963); Garhi Danra-Tuwa, 2200-1800 m (Nov. 4, 1963); Baroya Khimty-Thakma Khola, 2700-3000 m (Nov. 16, 1963); Bhandukay-Yamphodin, 2200-2500 m (Nov. 16, 1963).

Distr. Madagascar, India, Indo-China, S. China, Formosa, and S. Japan (Kyushu).

This species and *C. filicina* are two common species of the section Indicae in Eastern Himalaya, with a number of local variants. A sound judgement as to which of these variants are valid cannot be made by the studies of local populations only.

Carex (Decorae) **decora** Boott, Illustr. Carex **1**: 5. t. 15 (1858)-Fl. Brit. Ind. **6**: 725 (1894)-Kükenthal, l.c. 548 (1909).

Phalut, 3500 m (Jun. 4, 1960); Chia Bhanjang-Phalut, 3100-3500 m (Jun. 2, 1960).

Distr. Sikkim.

Carex (Atratae) **Duthiei** C. B. Clarke in Hooker f., Fl. Brit. Ind. **6**: 731 (1894).

C. atrata L. var. *pullata* Boott, Illustr. Carex **3**: 114, t. 364 (1862).

C. atrata L. subsp. *pullata* (Boott) Kükenthal, l.c. 400 (1909).

Phalut-Sandakphu, 3500 m (Jun. 6, 1960); Phalut, 3400 m (Jun. 5, 1960).

Distr. Alpine regions, throughout Himalaya, eastern Tibet, China, and Japan.

Carex (Indicae) **filicina** Nees ex Wight, Contrib. Bot. Ind. 123 (1834)-Fl. Brit. Ind. **6**: 717 (1894), incl. var. *meiogyna* Kükenthal, l.c. 274 (1909).

C. meiogyna Nees, l.c. 123 (1834), p.p.

C. filicina Nees var. *meiogyna* (Nees) Strachey, Cat. Pl. Kumaon, 73 (1854)-

Kükenthal, l.c. 274 (1909).

Batasi, 2200 m (May 2, 1960); Batasi-Palmajua, 2100–2300 m (May 3, 1960); Rimbick-Ramam, 1900–2100 m (May 7, 1960); Yoksam-Bakkim, 1900–2200 m (May 18, 1960); Sinduwa, 2100 m (Oct. 23, 1963); Bilbatay Bhanjang 2200 m (Oct. 26, 1963); Minchin Dhap-Mul Pokhari, 2500–2750 m (Oct. 29, 1963); above Lelep, 1700 m (Nov. 9, 1963); Baroya Khimty, 2500 m (Nov. 11, 1963); Baroya Khimty-Thakma Khola, 2700–3000 m (Nov. 16, 1963); Thakma Khola-Yamphodin, 2700–3000 m (Nov. 17, 1963); Batasay-Bhuspate Danra, 2500 m (Dec. 1, 1963).

Distr. Subtropical montane forest of Monsoon District of Eastern India, Himalaya, Burma, Indo-China, Malaysia, southeastern China, and Formosa.

Carex (Hymenochlaenae) **finitima** Boott, Illustr. **1**: 44, t. 112 (1858)–Fl. Brit. Ind. **6**: 736 (1894)–Kükenthal, l.c. 598, f. 101 E-H (1909).

Batasi-Palmajua, 2300–2600 m (May 3, 1960); Rimbick-Ramam, 1900–2400 m (May 7, 1960); Chia Bhanjang-Phalut, 3100–3600 m (Jun. 2, 1960); Garibans-Tonglu, 2800–3000 m (Jun. 7, 1960).

Distr. E. Himalaya and eastward to W. China (Szechuan), and Malaysia.

Carex (Decorae) **inclinis** C. B. Clarke in Fl. Brit. Ind. **6**: 728 (1894)–Kükenthal, l.c. 544 (1909).

Batasi-Palmajua, 2300-2600 m (May 3, 1960).

Distr. E. Himalaya (Sikkim).

This poorly collected species can be easily recognized by its slender habit with long-creeping stolons and loosely-flowered androgynous spikes and by the reddish-purplish basal sheaths which are disintegrated into reticulate fibers.

Carex (Decorae) **insignis** Boott, Illustr. Carex. **1**: 5, t. 14 (1858)–Fl. Brit. Ind. **6**: 725 (1894)–Kükenthal, l.c. 546, f. 90 (1909).

Butia Basti, Darjeeling, 2000 m (Apr. 6, 1960); Ghatte-Khebang, 1600–1700 m (Nov. 19, 1963).

Distr. E. Himalaya (Nepal to Bhutan), and Assam.

Carex (Hymenochlaenae) **japonica** Thunberg, Fl. Jap. 38 (1784).

subsp. **chlorostachys** (Kükenthal) T. Koyama, stat. nov.

C. Doniana Sprengel, Syst. Veg. **3**: 825 (1823).

C. chlorostachys (non Steven 1813) D. Don in Trans. Linn. Soc. **14**: 330 (1825).

C. japonica Thunb. var. *chlorostachys* Kükenthal, l.c. 620 (1909).

Takdah, 1600 m (Apr. 18, 1960); Senchal-Takdah, 2400–1600 m (Apr. 17, 1960), Rimbick-Ramam, 1900–2400 m (May 7, 1960).

Distr. E. Himalaya through central China northeastward to Japan.

Since the binomial, *C. chlorostachys* D. Don non Steven, is illegitimate, Kükenthal's transfer of this epithet to a varietal rank should be accepted as new dating from Kükenthal's publication (1909) (Art. 72 of International Code). The new combination proposed above should, therefore, be cited as *C. japonica* subsp. *chlorostachys* (Kükenth.).

Carex (Graciles) **longipes** D. Don in Trans. Linn. Soc. **14**: 329 (1825)–Drejer, Symb. Caric. t. 10 (1844)–Fl. Brit. Ind. **6**: 704 (1894)–Kükenthal, l.c. 603 (1909).

Lopchu, 1500 m (Apr. 29, 1960); Ghum-Kurseong, 2200 m (Jun. 22, 1960); Bilbatay Bhanjang-Hati Sar, 2200–2700 m (Oct. 27, 1961); Helok-Baroya Khimty, 1500–2500 m (Nov. 15, 1963).

Distr. Himalaya, and montane central China.

The collections cited above, each represented by several duplicate specimens, show a considerable variability in the length and the number of spikes in an inflorescence, the density of pistillate flowers and the scabridity of utricles. Two local variants, vars. *nepalensis* and *dissitiflora*, which are resting chiefly on these characters, cannot be held.

In Eastern Himalaya the section Graciles is represented by the present species and *Carex lenta* D. Don, the latter being absent in the gatherings handled in this report.

Carex (Pauciflorae) **microglochin** Wahlenb. in Vet.-Akad. Nya Handl. Stockh. **24**: 140 (1803)–Fl. Brit. Ind. **6**: 711 (1894)–Boott, Illustr. Carex **4**: t. 589, f. 1–5 (1899)–Kükenthal, l.c. 108, f. 14 D (1909).

Gamothang, 3800 m (May 27, 1960).

Distr. Arctic and alpine regions of Northern Hemisphere.

Carex (Hymenochlaenae) **munda** Boott, Illustr. Carex **1**: 7, t. 20 (1858)–Fl. Brit. Ind. **6**: 727 (1894)–Kükenthal, l.c. 254 (1909).

Migothang–Nayathang, 3300–3900 m (Jun. 1, 1960); Phalut, 3500 m (Jun. 4, 1960).

Distr. Endemic to Sikkim and adjacent areas.

I propose to place this species and its close ally, *Carex fragilis* Boott of Sikkim, in the section Hymenochlaenae. The attribution depends chiefly upon the characters of utricles particularly the thinly herbaceous walls with many slender veins, well developed basal leaves, and the absence of coloration in most part of the plants, characters pertaining to the species of Hymenochlaenae. *Carex munda* has been considered to be closely related to Indocarices because of the presence of secondary spikes arising from some achene-bearing utricles of the primary spikes. The partly compound inflorescence of precisely the same condition, however, frequently occurs in the species of Hymenochlaenae, e.g., *C. olivacea*, *C. Brownii*, or *C. dispalata*, suggesting that the *Carex munda* complex cannot be segregated from Hymenochlaenae only by this compound nature of spikes. The rhachilla-bearing utricles in Indocarices are not only empty but also highly metamorphosed, becoming more like a bracteole.

Carex (Atratae) **Nakaoana** T. Koyama in Act. Phytotax. Geobot. **15**: 113 (1954)–Ohwi & T. Koyama in Kitamura, Faun. & Fl. Nepal Himal. 86, f. 2 (1955).

North of Jongri, along the Choktsering Chu, 4000–4500 m (May 25, 1960); Gamothang, 3800 m (May 29, 1960); Phalut, 3000–3500 m (Jun. 5, 1960).

Distr. Endemic in E. Himalaya.

This distinct species is remotely related only to the *Carex sempervirens* complex of southeastern Europe.

Carex (Multiflorae) **nubigena** D. Don in Trans. Linn. Soc. **14**: 326 (1825)–Boott, Illustr. Carex **1**: 5. 2 (1858)–Fl. Brit. Ind. **6**: 702 (1894)–Kükenthal, l.c. 145 (1909).

Ramam–Phalut, 2400–3500 m (May 9, 1960); Phalut, 3500 m (Jun. 5, 1960); Penlong La, Gangtok, 2100 m (Jun. 16, 1960); Darjeeling, 2000 m (Jun. 21, 1960); Senchal–Tiger Hill, 2400 m (Jun. 23, 1960); Bilbatay Bhanjang–Hati Sar, 2200–2700 m

(Oct. 27, 1963); Baroya Khimty, 2800 m (Nov. 11, 1963); Helok–Baroya Khimty, 1500–2500 m (Nov. 15, 1963).

Distr. Throughout Himalaya, and C. & S. montane China.

In Japan *Carex nubigena* is represented by its subspecies *albata* and *Franchetiana*. A discussion on the phytogeography and taxonomy of the infra-specific taxa may be found in my previous paper (T. Koyama in Bot. Mag. Tokyo **72**: 302 1959).

Carex (Hymenochlaenae) **oedorrhampha** Nelmes in Kew Bull. **1939**: 659, (1939).

C. tumida Boott, Illustr. Carex **1**: 66, t. 181 (1858)–Fl. Brit. Ind. **6**: 741 (1894)–Kükenthal, l.c. 615 (1909).

Takdah, Darjeeling, 1600 m (Apr. 18, 1960).

Distr. E. Himalaya, Assam, and S. China.

Carex (Decorae) **polycephala** Boott, Illustr. Carex **1**: 4, t. 12, (1858)–Fl. Brit. Ind. **6**: 625 (1894)–Kükenthal, l.c. 605 (1909).

Batasi–Palmajua, 2100–2300 m (May 3, 1960); Garibans–Tonglu, 2800–3000 m (June 7, 1960); Ranga Pani–Ghorwa, 700–300 m (Dec. 9, 1963).

Distr. Endemic to Sikkim and Assam.

A distinct species with a large panicle and pale-green utricles and glumes.

Carex (Capitellatae) **rara** Boott in Proc. Linn. Soc. **1**: 284 (1845)–Boott, Illustr. Carex **1**: t. 109 (1858)–Fl. Brit. Ind. **6**: 713 (1894)–Kükenthal, l.c. 102, f. 21, N-O (1909).

Phalut, 3000–3500 m (Jun. 5, 1960).

Distr. E. Himalaya, Assam, Ceylon, and Malaysia.

This species is represented in Japan by its subspecies *biwensis*, which differs from the mother species primarily in relatively small utricles and less brown-colored glumes. The boundary, however, occasionally becomes obscure particularly in Chinese specimens.

Carex (Elongatae) **Rochebruni** Franch. et Sav., Enum. Pl. Jap. **2**: 555 (1879).

C. remota L. var. *Rochebruni* (Franch. et Sav.) C. B. Clarke in Fl. Brit. Ind. **6**: 707 (1894).

C. remota L. subsp. *Rochebruni* (Franch. et Sav.) Kükenthal, l.c. 234 (1909).

Batasi-Palmajua, 2300-2600 (May 3, 1960).

Distr. E. Himalaya, temperate central and southern China, and Japan.

The plants from E. Himalaya hardly differ from those of Japan in every morphological details.

Carex (Trachychlaenae) **setigera** D. Don in Trans. Linn. Soc. **14**: 330 (1824)–Fl. Brit. Ind. **6**: 743 (1894)–Kükenthal, l.c. 419 (1909).

C. setigera D. Don var. *minor* Strachey, Cat. Pl. Kumaon 73 (1854).

Ghum–Lopchu, 2200 m (Jun. 19, 1960); Hati Sar–Minchin Dhap, 2700–2800 m (Oct. 28, 1963); Thakma Khola–Diorali Bhanjang (Nov. 4, 1963).

Distr. Himalaya (Kashmir to Sikkim).

Carex (Indicae) **stramentitia** Boott ex Böckeler in Linnaea **40**: 351 (1876)–Fl. Brit. Ind. **6**: 717 (1894)–Kükenthal, l.c. 264 (1909).

Taplejung, 1700 m (Nov. 2, 1963); Taplejung–Garhi Dhanra, 1500–2000 m (Nov. 3, 1963); above Helok, 1500 m (Nov. 8, 1963, fr. white); Helok, 1500 m (Nov. 9, 1963);

Mai Majuwa-Dhara Pani, 1600–1500 m (Dec. 4, 1963).

Distr. N. India, N. Burma, Thai, and Tonkin.

A distinct species easily separable from superficially resembled *C. cruciata* by the globose utricles, which are abruptly contracted above to a relatively short beak and are white at maturity. The basal part of culms, which becomes hardened for a length of 15 to 25 cm, is tightly clothed with the fibrous remains of basal leaf sheaths exhibiting an extreme aphyllopic nature.

Carex (Hymenochlaenae) **tumida** Boot, Illustr. Carex **1**: 66, t. 181 (1858)–Fl. Brit. Ind. **6**: 741 (1894)–Kükenthal, l.c. 615 (1909).

Takdah, 1600 m (Apr. 18, 1960).

Distr. Himalaya, Assam, and S. China.

Cyperus brevifolius (Rottb.) Hassk. [ssp. **brevifolius**] Cat. Hort. Bogor. 24 (1844)–Kükenthal, l.c. 600 (1936).

Kyllinga brevifolia Rottboell, Descr. et Icon. Par. Pl. 13, 5. 4, f. 3 (1773)–Fl. Brit. Ind. **6**: 588 (1893).

Kathmandu–Thankot, 1400–1300 m (Sep. 19, 1963); Sinduwa, 2100 m (Oct. 23, 1963, in part); Dumhan–Taplejung, 700–2000 m (Nov. 1, 1963).

Distr. Cosmopolitan; temperate, subtropical and tropical regions of both hemispheres.

subsp. **leiolepis** (Franch. et Sav.) T. Koyama, stat. nov.

Kyllinga monocephala Rottb. var. *leiolepis* Franch. et Sav., Enum. Pl. Jap. **2**: 108 (1877).

Mangalbare–Lam Pokhari, 2600–2900 m (Oct. 28, 1963).

Distr. Temperate Himalaya, China, and Japan.

Subspecies *leiolepis* differs from the mother species in its comparatively larger glumes having a completely smooth keel. In ssp. *brevifolius* the glumes have spinules on the keel.

Cyperus compactus Retzius, Obs. Bot. **5**: 10 (1789)–Kükenthal, l.c. 423 (1936).

C. spinulosus Roxb., Fl. Ind. ed. 2, **1**: 203 (1832).

Mariscus dilutus (Vahl) Nees ex Wight, Contr. Bot. Ind. 90 (1834).

M. microcephalus Presl, Rel. Haenk. **1**: 182 (1830)–Fl. Brit. Ind. **6**: 624 (1893).

M. compactus (Retz.) Druce, Rep. Bot. Exch. Club Brit. Is. **6**: 634 (1917)–C. E. C. Fischer in Gamble, Fl. Madras **9**: 1645 (1931).

Biratnagar, 200 m (Oct. 15, 1963); Sibganja–Gauriganja, 200 m (Dec. 12, 1963); Illam–Jog Mai, 200 m (Dec. 12, 1963).

Distr. Tropical and subtropical continental Asia, Malaysia, and Micronesia.

Cyperus compressus L., Sp. Pl. ed. 1, 46 (1753)–Fl. Brit. Ind. **6**: 605 (1893)–Kükenthal in Pfl.-reich IV–20, Ht. **101**: 156, 16, f. 4, A-D (1935)–Ahuja in Bull. Bot. Gard. Lucknow no. **85**: t. 3 (1963).

Dhankuta, 1200 m (Oct. 21, 1963); Bagdogra, 200 m (Jun. 27, 1960).

Distr. Cosmopolitan; warm-temperate, subtropical and tropical regions of all the world.

Cyperus cuspidatus H. B. K., Nov. Gen. et Sp. Pl. **1**: 204 (1815)–Fl. Brit. Ind. **6**: 598 (1893)–Kükenthal, l.c. 262, f. 29 E (1936)–Ahuja in Bull. Bot. Gard.

Lucknow no. **110**: t. 14 (1965).

Dhankuta (Oct. 19, 1963); Dhankuta–Murhay, 1200–2000 m (Oct. 23, 1963); Nissim–Dumhan, 1000 m (Oct. 30, 1963, in part.).

Distr. Pantropic.

Cyperus cyperinus (Retzius) Suringar, Het Gesl. Cyperus Mal. Archip. 154, t. 4, f. 10 (1898)–Kükenthal, l.c. 518 (1936).

Kyllinga cyperinus Retzius, Obs. Bot. **6**: 21 (1791).

Mariscus cyperinus (Retzius) Vahl, Enum. Pl. **2**: 377 (1806)–Fl. Brit. Ind. **6**: 621 (1893)–C.E.C. Fischer in Gamble, Fl. Madras **9**: 1644 (1931).

Gangtok, 1650 m (Jun. 17, 1960); Gangtok–Saramsa Medicinal Garden (Jun. 13, 1960).

Distr. Warm and tropical regions of eastern Asia, from India through China eastwards to Japan, and southeastwards to Malaysia and northern Australia.

This species and *Cyperus cyperoides* are taxonomically closely related to each other. In tropical Asia the two species often grow together, yet no intermediate forms have ever been noticed.

Cyperus cyperoides (L.) O. Kuntze, Rev. Gen. Pl. **3** (2): 333 (1898)–Kükenthal, l.c. 514 (1936).

Scirpus cyperoides L., Mant. Pl. **2**: 181 (1771).

Mariscus Sieberianus Nees ex C. B. Clarke in Fl. Brit. Ind. **6**: 622 (1893).

Gangtok–Saramsa Medicinal Garden, 1650 m (Jun. 17, 1960); Rangpo–Tista Bazar, 350–300 m (Jun. 18, 1960); Dhankuta, 1200 m (Oct. 21, 1963).

Distr. Cosmopolitan; warm, subtropical and tropical regions of both hemispheres.

Cyperus diffusus Vahl, Enum. Pl. **2**: 312 (1806)–Fl. Brit. Ind. **6**: 603 (1893)–Kükenthal, l.c. 208 (1936).

Peshok, 900 m (Apr. 27, 1960); Tista–Rangpo, 300–350 m (Jun. 13, 1960); Tista, Darjeeling, 300 m (Jun. 19, 1960); Ghorwa–Sanichare, 300–200 m (Dec. 10, 1963).

Distr. Pantropic with several local variants.

Cyperus difformis L., Cent. Pl. **2**: 6 (1756)–Fl. Brit. Ind. **6**: 599 (1893)–Kükenthal, l.c. 237 (1936)–Ahuja in Bull. Bot. Gard. Lucknow no. **85**: t. 4 (1963).

Biratnagar, 200 m (Oct. 15, 1963); Dumhan, 700 m (Oct. 31, 1963); Bharomdin–Tharpu, 1000–1200 m (Nov. 25, 1963).

Distr. A common weed in rice paddy.

Cyperus distans L. f., Suppl. Pl. 103 (1781)–Fl. Brit. Ind. **6**: 607 (1893)–Suringar, l.c., t. 1, f. 9 et t. 4, f. 29 (1898)–Kükenthal, l.c. 137 (1935).

Gangtok, 1650 m (Jun 13, 1960); Rangpo–Tista, 350–300 m, (Jun. 18, 1960), Tista (Jun. 19, 1960; Jun 20, 1960) ; Bagdogra, 200 m (Jun. 27, 1960).

Distr. Pantropic.

Cyperus Haspan L., Sp. Pl. ed. 1, 45 (1753)–Fl. Brit. Ind. **6**: 607 (1893)–Kükenthal, l.c. 247 (1936)–Ahuja in Bull. Bot. Gard. Lucknow no. **110**: t. 17 (1965).

Bharomdin–Tharpu, 1000–1200 m (Nov. 25, 1963); Gangtok, 1650 m (Jun. 13, 1960); Kalimpong, 1350 m (Jun. 20, 1960); Rangpo–Tista, 350–300 m (Jun. 18, 1960).

Distr. Cosmopolitan; temperate, subtropical and tropical regions of both hemispheres with a few local variants.

A common perennial weed in rice fields. This species would have possibly expanded its range with the introduction of rice plants.

Cyperus Iria L., Sp. Pl. ed. 1, 45 (1753)-Fl. Brit. Ind. **6**: 606 (1893)-Kükenthal, l.c. 250 (1936)-Ahuja, l.c. no. 85, t. 6 (1963).

Rayang, 250 m (Apr. 21, 1960); Rangpo-Tista (Jun. 18, 1960); Kathmandu, 1400 m (Oct. 13, 1963); Biratnagar, 200 m (Oct. 14, 1963); Dumhan, Tamur River, 700 m (Oct. 31, 1963).

Distr. Cosmopolitan; temperate, subtropical and tropical regions of all the world.

As a common weed in farm lands, the dispersal of this species may possibly involve human factors. As the *Cyperus Iria* complex apparently has the center of maximum variation in the Indian subcontinent, the occurrence of this species outside this area seems to be of adventitious origin.

Cyperus Kyllingia Endlicher, Cat. Hort. Acad. Vindb. **1**: 94 (1842)-Kükenthal, l.c. 606, f. 64 C-D (1936).

Kyllinga monocephala Rottb., Descr. Icon. Rar. Pl. 13, t. 4, f. 4 (1773)-Fl. Brit. Ind. **6**: 588 (1893).

Rangpo-Tista Bazar, 350-300 m (Jun. 18, 1960); Dhankuta, 1200 m (Oct. 21, 1963); Dumhan, Tamur River, 700 m (Oct. 31, 1963).

Distr. Pantropic.

Cyperus malaccensis Lamarck, Tab. Encycl. **1**: 146 (1791)-Fl. Brit. Ind. **6**: 608 (1893)-Suringar, Het Gesl. Cyp. Mal. Archip. t. 4, f. 22 (1898).

Ranga Pani-Ghorwa, 700-300 m (Dec. 9, 1963); Sanichare, 200 m (Dec. 10, 1963); Sibganja-Gauriganja, 200 m (Dec. 12, 1963).

Distr. From subtropical Mediterranean coast through India and Indo-China southwards to Malaysia.

In southern China and Ryukyu Islands this species is represented by its subspecies *monophyllus* (Vahl) T. Koyama, stat. nov. (*Cyperus monophyllus* Vahl, Enum. Pl. **2**: 352 (1806); *Cyp. malaccensis* Lamk. var. *brevifolius* Böckeler in Linnaea **35**: 604 (1868), concerning the specimens cited), which differs from ssp. *malaccensis* by the reduced condition of leaves and less recurved glumes. In Ryukyu and China the clums of ssp. *monophyllus* are used for making a kind of rough mat.

Cyperus Michelianus (L.) Link, Hort. Bot. Berol. **1**: 303 (1827)-Kükenthal, l.c. 311, f. 35 A-E (1936).

Scirpus Michelianus L., Sp. Pl. ed. 1, 52 (1753)-Fl. Brit. Ind. **6**: 662 (1893)

Sibganja-Gauriganja, 200 m (Dec. 12, 1963);

Distr. Widely spread in the warm regions of Eurasia, from central Europe through central Asia, China and southern Siberia southwards to northern India and Indo-China, and eastwards to Japan.

Cyperus pilosus Vahl, Enum. Pl. **2**: 354 (1806)-Fl. Brit. Ind. **6**: 609 (1893)-Suringar, Het Gesl. Cyp. Mal. Archip. t. 4, f. 32 (1898)-Kükenthal, l.c. 92 (1935).

Nissim-Dumhan, 1000 m (Oct. 30, 1963); Dumhan, Tamur River, 700 m (Oct. 31, 1963).

Distr. Tropical and subtropical regions of the Old World, from West Africa through India and Indo-China southwards to Malaysia and eastwards to western Japan.

Many varieties described from tropical Asia are hardly held. The specimens that may be classified as var. *obliquus*, *muticus*, or *fimbriatus* in Eastern Himalaya fall within the continuous variation range shown by Japanese plants of this species in the length of the awns and the color of the glumes, the number of florets consisting a spikelet, and the scabrosity of the rhachis and the margins of the bracts.

Cyperus pseudokyllingoides Kükenthal, l.c. 501 (1936).

Kyllinga cyperoides Roxb., Fl. Ind. ed. 2, **1**: 182 (1832).

Courtoisia cyperoides (Roxb.) Nees ex Wight, Contr. Bot. Ind. 92 (1834)–Fl. Brit. Ind. **6**: 625 (1893)–C.E.C. Fischer in Gamble, Fl. Madras **9**: 1645 (1931).

Dumhan, Tamur River, 700 m (Oct. 31, 1963); Ranja Pani–Ghorwa (Dec. 9, 1963); Ghorwa–Sanichare (Dec. 10, 1963); Sibganja–Gauriganja (Dec. 12, 1963).

Distr. Sikkim, Assam, N. Burma, and Tonkin.

This species is characteristic in its glumes having a distinct, slightly spongy wing along the keel. Because of this character, the present species, together with its close African allies, has been generically separated from *Cyperus* under the name of *Courtoisia.* I am in full agreement with Kükenthal in sinking *Courtoisia* into the subgenus *Mariscus* of the genus *Cyperus* as *Courtoisia* does not differ from the latter in any important morphological details. In most divisions of *Cyperus* the species with winged glumes and those with wingless glumes coexist, e.g., *Cyperus Kyllingia* with winged glumes and *C. brevifolius* with wingless glumes in the subgenus *Kyllinga.*

Cyperus pumilus L., Cent. Pl. **2**: 6 (1776)–Kükenthal, l.c. 375, f. 44 A-C (1936).

Cyperus pulvinatus Nees et Meyen ex Wight, Contr. Bot. Ind. 674 (1834).

Pycreus nitens Nees in Nov. Act. Nat. Cur. 19, Suppl. **1**: 53 (1843)–Fl. Brit. Ind. **6**: 591 (1893).

Pycreus pumilus (L.) Domin in Bibl. Bot. **85**: 417 (1915)–C. E. C. Fischer in Gamble, Fl. Madras **9**: 1627 (1931).

Biratnagar, 200 m (Oct. 14, 1963); Dumhan, Tamur River, 700 m (Oct. 31, 1963).

Distr. India, Indo-China, and Malaysia.

Cyperus rotundus L., Sp. Pl. ed. 1, 45 (1753)–Kükenthal, l.c. 107, f. 13 (1935)–Ahuja in Bull. Bot. Gard. Lucknow no. **85**: t. 10 (1963).

Tista Bazar, 300 m (Mar. 28, 1960); Rayang, 250 m (Apr. 21, 1960); Kalimpong–Darjeeling, 1350–2150 m (Jun. 20, 1960); Dumhan, Tamur River, 700 m (Oct. 31, 1963).

Distr. Cosmopolitan, weedy in many places.

Cyperus sanguinolentus Vahl, Enum. Pl. **2**: 351 (1806)–Kükenthal, l.c. 385 (1936).

Pycreus sanguinolentus (Vahl) Nees in Linnaea **9**: 238 (1835)–Fl. Brit. Ind. **6**: 590 (1893)–Ahuja in Bull. Bot. Gard. Lucknow no. **110**: t. 21 (1965).

Kathmandu Airport, 1400 m (Oct. 13, 1963); Dhankuta, 1200 m (Oct. 21, 1963); Sinduwa, 2100 m (Oct. 23, 1963); Bilbatay Bhanjang–Hati Sar, 2200–2700 m (Oct. 27, 1963); Nissim–Dumhan, 1200 m (Oct. 30, 1963); Dumhan, 700 m (Oct. 31, 1963); Taplethok–Helok, 1300–1500 m (Nov. 6, 1963); Bharomdin–Tharpu, 1000–1200 m (Nov. 25, 1963).

Distr. Widespread in temperate, subtropical and tropical regions of the Mediterranean coast, Africa, Asia, and Oceania.

Cyperus sesquiflorus (Torrey) Mattf. et Kükenthal ex Kükenthal, l.c. 591 (1936).

subsp. **cylindricus** (Nees) T. Koyama, stat. nov.

Kyllinga cylindrica Nees ex Wight, Contr. Bot. Ind. 91 (1834)-Fl. Brit. Ind. **6**: 588 (1893).

Rangpo–Tista, 350–300 m (Jun. 18, 1960).

Distr. Tropical Africa, India, Indo-China, Malaysia, S. China, and Formosa.

Subspecies *cylindricus* is a local variant of ssp. *sesquiflorus*, which is widely distributed in tropical regions of the New World and Oceania. Main differences are that the central spike of ssp. *cylindricus* is narrower than that of ssp. *sesquiflorus*. The fruit bearing glumes in ssp. *cylindricus* tend to be slightly broader and shorter than those of ssp. *sesquiflorus*.

Cyperus silletensis Nees ex Wight, Contr. Bot. Ind. 79 (1834)-Fl. Brit. Ind. **6**: 600 (1893)-Kükenthal, l.c. 242 (1936)-Ahuja in Bull. Bot. Gard. Lucknow no. **110**: t. 22 (1965).

Rangpo–Tista Bazar, 350–300 m (Jun. 18, 1960).

Distr. Northern India, Burma, and Indo-China.

Cyperus substramineus Kükenthal, l.c. 398 (1936).

C. stramineus Nees ex Wight, Contr. Bot. Ind. 74 (1834); non Desf. (1820).

Pycreus stramineus (Nees ex Wight) C. B. Clarke in Fl. Brit. Ind. **6**: 589 (1893).

Sibganja–Mahara Bahara, 200 m (Dec. 12, 1963); Sanichare–Sibganja, 200 m (Dec. 11, 1963).

Distr. Endemic in India.

Cyperus tenuispica Steudel, Syn. Glum. **2**: 11 (1855)-Kükenthal, l.c. 245, f. 28 A-D (1936).

C. flavidus Retzius sensu C. B. Clarke in Fl. Brit. Ind. **6**: 600 (1893).

Rayang, 250 m (Apr. 20, 1960); Kalimpong, 1300 m (Apr. 23, 1960); Rangpo–Tista Bazar, 350–300 m (Jun. 18, 1960); Nissim–Dumhan, 1000 m (Oct. 30, 1963); Kathmandu Airport, 1400 m (Oct. 31, 1963).

Distr. Subtropical and tropical regions of Africa, Asia, and Pacific Islands.

This species frequently occurs with closely related *Cyperus Haspan* as a weed in rice fields, yet these two are distinct without any intermediate forms.

Eleocharis Chaetaria Römer et Schultes, Syst. Veg. **2**: 154 (1817)-Fl. Brit. Ind. **6**: 629 (1893)-Svenson in Rhodora **39**: t. 461, f. 10 (1937).

Ghorwa–Sanichare, 300–200 m (Dec. 10, 1963).

Distr. India, Ceylon, Indo-China, Malaysia, and Ryukyu.

According to Kern (Reinwardtia **6**: 35, 1961), this Old World species is identical with *E. retroflexa* of the Carribean region. There is, however, a certain difference between the two plants, which consists mainly in the minor detail of the achenes, and the size of achenes and glumes, although the difference is very trifling. Considering also the fact that in these two plants their rather limited ranges of distribution are greatly separated from each other, I tend to keep these two plants separate until further studies demonstrate their identity.

Eleocharis congesta D. Don, Prodr. Fl. Nepal. 41 (1825)–Fl. Brit. Ind. **6**: 630 (1893)–Svenson, l.c. t. 546, f. 2 (1939).

Palmajua–Rimbick, 2200–2300 m (May 5, 1960); Gangtok, 1650 m (Jun. 18, 1960); Kathmandu Airport, 1400 m (Oct. 13, 1963); Biratnagar, 200 m (Oct. 14, 1963); Taplethok–Helok, 1300–1500 m (Nov. 6, 1963).

Distr. India, and Indo-China.

In the Japanese Archipelago this species is represented by subspecies *japonica* (Miquel) T. Koyama, stat. nov. (=*E. japonica* Miquel, Ann. Mus. Bot. Lugd.-Bat. **2**: 142, 1865), which differs from the typical phase in slenderer culms, smaller spikelets and smaller achenes.

Eleocharis dulcis (Burm. f.) Trinius ex Henschel, Vita Rumph. 186 (1833).

Andropogon dulce Burm. f., Fl. Ind. 219 (1768).

Eleocharis plantaginea (Retzius) Römer et Schultes, Syst. Veg. **2**: 150 (1817)–Fl. Brit. Ind. **6**: 625 (1893)–Svenson, l.c. t. 537, f. 6 (1936)–S. T. Blake in Proc. Roy. Soc. Queensl. **50**: t. 8, f. 6–9 (1939).

Mahara Bahara–Kathgara, 200 m (Dec. 13, 1963).

Distr. Tropics of the Old World from Africa through Indian subcontinent eastwards to Japan and to southern Pacific islands, also Malaysia and Australia.

Tubers of a variant of this species, cv. *tuberosa* (Roxb.) T. Koyama, are cultivated in the paddy fields in India and China, and are known at vegetable markets as the Chinese water-chestnut.

Fimbristylis aestivalis (Retzius) Vahl, Enum. Pl. **2**: 288 (1806)–Fl. Brit. Ind. **6**: 637 (1893).

Scirpus aestivalis Retzius, Obs. Bot. **4**: 12 (1786)–Roxb., Fl. Ind. ed. Carey **1**: 227 (1820).

Rayang, 250 m (Apr. 20, 1960); Dentam–Pamianchi, 1600 m (May 12, 1960); Yoksam, 1700 m (May 17, 1960); Kalimpong, 1300 m (June 20, 1960); Dumhan, Tamur River, 700 m (Oct. 31, 1963); Dumhan–Taplejung, 700–2000 m (Nov. 1, 1963).

Distr. Widely spread in temperate to tropical regions of Asia, from India through China eastwards to Japan and to Malaysia and northern Australia.

Fimbristylis bisumbellata (Forsk.) Bubani, Dodecanth. 30 (1850)–C.E.C. Fischer in Kew Bull. **1935**: 145 (1935).

Scirpus bisumbellatus Forskål, Fl. Aegypt-Arab. **1**: 15 (1775).

F. dichotoma Vahl sensu C. B. Clarke in Fl. Brit. Ind. **6**: 635 (1893).

Rayang, 2500 m (Apr. 21, 1960).

Distr. Africa, western Asia, India, Malaysia, Formosa, and Ryukyu.

This species is characteristically intermediate between *F. dichotoma* and *F. aestivalis*, of which the ranges of distribution overlap in greater portions. An experimental study is needed to determine whether or not this is a natural hybrid between the two species mentioned above.

Fimbristylis complanata (Retz.) Link, Hort. Berol. Descr. **1**: 292 (1827)–Fl. Brit. Ind. **6**: 646 (1893).

Scirpus complanatus Retzius, Obs. Bot. **5**: 14 (1789).

Sinduwa, 2100 m (Oct. 23, 1963).

Distr. India to Malaysia, southern China, Ryukyu, and Japan.

Fimbristylis dichotoma (L.) Vahl, [ssp. **dichotoma**] Enum. Pl. **2**: 287 (1806)-C.E.C. Fischer in Kew Bull. **1935**: 150 (1935).

Scirpus dichotomus L., Sp. Pl. ed. 1, 50 (1753).

F. diphylla (Retz.) Vahl, Enum. Pl. **2**: 289 (1806)-Fl. Brit. Ind. **6**: 636 (1893), incl. var. *annua* C. B. Clarke.

Rangpo–Tista, 350–300 m (Jun. 18, 1960); Gangtok, 1650 m (Jun. 18, 1960); Kalimpong, 1300 m (Jun. 20, 1960); Dhankuta, 1200 m (Oct. 19, 1963); Nissim–Dumhan, 1500–700 m (Oct. 30, 1963); Dumhan, Taplejung District, 700 m (Oct. 31, 1963).

Distr. Cosmopolitan; tropical, subtropical and warm-temperate regions of both hemispheres.

subsp. **podocarpa** (Nees & Meyen) T. Koyama in Micronesica **1**: 87 (1964).

F. podocarpa Nees & Meyen in Wight, Contr. Bot. Ind. 98 (1834).

F. diphylla Vahl var. *pluristriata* C. B. Clarke in Fl. Brit. Ind. **6**: 637 (1893)-C. B. Clarke, Illustr. Cyp. t. 42, f. 3–6, Fig. 3–4 (1909).

Biratnagar, 200 m (Oct. 14, 1963).

Distr. India, Malaysia, Micronesia, and Polynesia.

This subspecies differs from ssp. *dichotoma* only in the characters of pistils: the presence of a conspicuous gynophore; the achenes tuberculate with 12 to 20 rows of epidermal cells vs. 8 to 10 rows of those in ssp. *dichotoma*; and the style tending to be broadly linear. The variation ranges of these characteristics still need investigations on a statistical basis.

Fimbristylis littoralis Gaudich. in Freycinet, Voy. Bot. 413 (1826).

F. miliacea Vahl sensu C. B. Clarke in Fl. Brit. Ind. **6**: 644 (1893).

Biratnagar, 200 m (Oct. 14, 1963); Mul Pokhari–Nissim, 2400–1500 m (Oct. 30, 1963); Dumhan, 700 m (Oct. 31, 1963); Taplejung–Heydewa, 2000 m (Nov. 3, 1963).

Distr. Tropical, subtropical and warm-temperate regions of both hemispheres; the distribution in neotropics may well be of an introduced origin.

Fimbristylis miliacea (L.) Vahl, Enum. Pl. **2**: 287 (1806), emend. S. T. Blake in Journ. Arn. Arb. **35**: 216 (1954).

Scirpus miliaceus L., Syst. Nat. ed. 10, **2**: 868 (1759).

F. quinquangularis (Vahl) Kunth, Enum. Pl. **2**: 229 (1837)-Fl. Brit. Ind. **6**: 644 (1893).

Biratnagar, 200 m (Oct. 14, 1963); Nissim–Dumhan, 2400–1500 m (Oct. 30, 1963); Dumhan, Tamur River, 700 m (Oct. 31, 1963).

Distr. Widely distributed in the Old World tropics, from Africa through the India eastwards to Formosa, Malaysia, and northern Australia.

Fimbristylis schoenoides (Retz.) Vahl, Enum. Pl. **2**: 286 (1806)-Fl. Brit. Ind. **6**: 634 (1893).

Scirpus schoenoides Retzius, Obs. Bot. **5**: 14 (1789).

Biratnagar, 200 m (Oct. 13, 1963); Dumhan, Tamur River, 700 m (Oct. 31, 1963).

Distr. India, Indo-China, Formosa, Malaysia, and northern Australia.

Fimbristylis squarrosa Vahl, Enum. Pl. **2**: 289 (1806)-Fl. Brit. Ind. **6**: 635 (1893).

Taplethok-Helok, 1300-1500 m (Nov. 6, 1963).

Distr. Widely distributed in the temperate and tropical regions of the Old

World; southern Europe, Africa, southern and eastern Asia.

The awnless phase, forma *esquarrosa*, occurs in Japan, Malaysia and Australia.

Kobresia aff. **nepalensis** (Nees) Kükenthal in Pfl.-reich IV-20, Ht. **38**: 40, f. 9 D (1909).

Chia Bhanjang-Phalut, 3100-3500 m (Jun. 2, 1960); Nayathang-Phalut, 3400 m (Jun. 2, 1960); Phalut, 3500 m (Jun. 5, 1960).

Distr. Himalaya (Kashmir to Sikkim).

Due to the immaturity of our collections, more accurate determination is impossible. According to Kükenthal, the inflorescences of *Kobresia nepalensis* are usually androgynous with a few staminate partial spikelets at the apex, while in our specimens the spikes are unisexual or bear staminate partial spikelets toward the base.

Kobresia Royleana (Nees) Böckeler in Linnaea **39**: 8 (1875)-Fl. Brit. Ind. **6**: 698 (1894)-Kükenthal, l.c. 45 (1909).

Jongri, 4000 m (May 22, 1960).

Distr. Turkestan, Afghanistan and Himalaya to S. W. China.

Kobresia sikkimensis Kükenthal, l.c. 47 (1909).

Jongri-Gamothang, 3800-4000 m (May 26, 1960); Gamothang, 3800 m (May 29, 1960).

Distr. Endemic to Sikkim.

Kükenthal (l.c.) did not give any description of the basal part of the plants. In our specimens, the culms are ascending from the short creeping rhizomes, which are closed with brown residues of leaf sheaths. The leaves are subbasal, i.e. the upper ones are surrounding the more or less decumbent part of culms.

Lipocarpha chinensis (Osbeck) Kern in Blumea, Suppl. **4**: 167 (1958).

Scirpus chinensis Osbeck, Dagb. Ostind. Resa 220 (1757).

L. argentea (Vahl) Steud., Nom. Bot. ed. 1, 485 (1821)-Fl. Brit. Ind. **6**: 667 (1893).

Rayang, 250 m (Apr. 20, 1960).

Distr. Old World Tropics: Africa, India, southern China, Indo-China, Formosa, Ryukyu, Malaysia, and northern Australia.

Scirpus (Lachnophorum) **comosus** Wallich ex Roxb., Fl. Ind. ed. Carey, **1**: 324 (1820).

Eriophorum comosum Wallich ex Nees in Wight, Contr. Bot. Ind. 111 (1834)-Fl. Brit. Ind. **6**: 664 (1893).

Phusri-Dhara Pani, 450-1200 m (Oct. 16, 1963); Dhankuta, 1200 m (Oct. 19, 1963).

Distr. Afghanistan, and Himalaya.

Scirpus (Actinoscirpus) **grossus** L. f., Suppl. Pl. 104 (1781)-Fl. Brit. Ind. **6**: 122 (1893).

S. maximus Roxb., Fl. Ind. ed. Carey, **1**: 231 (1820).

Sibganja-Mahara Bahara, 200 m (Dec. 12, 1963); Sibganja-Gauriganja, 200 m (Dec. 12, 1963); Mahara Bahara-Kathgara (Dec. 13, 1963).

Distr. India, Indo-China, Malaysia, and Bonin Islands.

Scirpus (Actaeogeton) **juncoides** Roxb. [Hort. Beng. 81 (1814), nom. nud.] Fl. Ind. ed. Carey, **1**: 228 (1820).

Scirpus erectus Poir. sensu C. B. Clarke, Fl. Brit. Ind. **6**: 656 (1893).

Mul Pokhari–Dumhan, 2400–700 m (Oct. 30, 1963); Dumhan–Taplejung (Nov. 1, 1963); Taplethok–Helok, 1300–1500 m (Nov. 6, 1963); Bharomdin–Tharpu, 1000–1200 m (Nov. 25, 1963); Rangali–Biratnagar, 200 m (Dec. 15, 1963).

Distr. India, Indo-China, China, Malaysia, Pacific Islands, and Japan.

Scirpus (Actaeogeton) **mucronatus** L. [ssp. **mucronatus**] Sp. Pl. ed. 1, 50 (1753)–Fl. Brit. Ind. **6**: 657 (1893)–T. Koyama in Journ. Fac. Sci. Univ. Tokyo Bot. **7** (6): 319, f. 10 A (1958).

Gokarna Forest, n.e. of Kathmandu, 1400 m (Sep. 23, 1963).

Distr. Eurasia, warm-temperate to tropical regions.

subsp. **robustus** (Miquel) T. Koyama in Quart. Journ. Taiwan Mus. **14**: 194 (1961).

S. triangulatus Roxb., Fl. Ind. ed. Carey, **1**: 219 (1820)–T. Koyama, l.c. 317, f. 10 B (1958).

S. muticus D. Don, Prodr. Fl. Nepal. 41 (1825).

S. mucronatus L. var. *robustus* Miquel, Ann. Mus. Bot. Lugd.-Bat. **2**: 143 (1865).

Mai Majuwa–Dhara Pani, 1600–1500 m (Dec. 4, 1963).

Distr. India, Malaysia, China, and Japan.

Scirpus supinus L., Sp. Pl. ed. 1, 49 (1753).

subsp. **lateriflorus** (Gmelin) T. Koyama, stat. nov.

Scirpus lateriflorus Gmelin, Syst. Veg. 127 (1791).

Scirpus supinus L. sensu Roxb., Fl. Ind. ed. Carey, **1**: 219 (1820)–Fl. Brit. Ind. **6**: 655 (1893).

Dumhan, by Tamur River, 700 m (Oct. 31, 1963); Bharomdin–Tharpu, 1000–1200 m (Nov. 25, 1963).

Distr. India, Ceylon, Indo-China, Malaysia, northern Australia, and Formosa.

Scirpus supinus as a species occurs in the tropical regions of both hemispheres with several subspecies. Although differences among the subspecies are minor and consist only in the details of achenes and glumes, each subspecies shows its own range of distribution. In this subspecies a flower is born at the bottom of a basal sheath, while the basal flower of this kind does not exist in ssp. *supinus*. Attempts have been made for the segregation of the taxa of the *S. supinus* complex using this characteristic.

Scleria levis Retzius, Obs. Bot. **4**: 13 (1786).

S. hebecarpa Nees ex Wight, Contr. Bot. Ind. 117 (1834)–Fl. Brit. Ind. **6**: 689 (1893).

Peshok–Tista, 900-300 m (Jun. 13, 1960); Tista, 300 m (Jun. 20, 1960).

Distr. Tropical and subtropical Asia, and Oceania.

ARACEAE (by Hiroshi Hara)

Acorus Calamus L., Sp. Pl. ed. 1, **1**: 324 (1753)–Fl. Brit. Ind. **6**: 555 (1893).

Taplejung, 1900 m (Nov. 2, 1963); Ghatte–Khebang, 1600–2000 m (Nov. 19, 1963); below Siling Tzokupa–Khebang, 2000–1700 m (Nov. 22, 1963); near Akasay, 2200 m (Nov. 30, 1963); Mai Majuwa–Dhara Pani, 1800–1500 m (Dec. 4, 1963).

Distr. sp. Europe (introduced?), Siberia, India east to Japan, and C. & N. America.

In this group, some geographical races with different chromosome numbers ($2n = 24, 36, 44, 48$) have recently been reported. The Himalayan plants collected at Taplejung and Akasay and grown in Tokyo are proved to have 44 somatic chromosomes by Dr. S. Kawano [Pl. 24 c, d], and they appear to belong to the same race as that of Japan.

Amorphophallus bulbifer (Roxb.) Blume in Rumphia **1**: 148 (1835)-Fl. Brit. Ind. **6**: 515 (1893)-Engler in Pfl.-reich IV-23 C, Ht. **48**: 98 (1911), var. *atroviridimaculatus* Engl.-Spring Fl. Sikkim Himal. f. 215, 218 & 219 (1963).

Arum bulbifer Roxburgh, Fl. Ind. ed. 2, **3**: 510 (1832).

Rangpo-Tista Bazar, 350 m (Jun. 18, 1960, fl.).

Distr. Tropical E. Himalaya (Sikkim), Khasia, India, and Burma.

Arisaema biflagellatum Hara in Journ. Jap. Bot. **36**: 77 (1961).

Below Sandakphu, 3500 m (Jun. 7, 1960, fl.—Typus); Phalut-Sandakphu, 3300-3600 m (Jun. 6, 1960, fl.).

Distr. Endemic to the Singalila Range.

The species has yellowish green spathe, and its limb is gradually attenuate to a long drooping flagellum 8-16 cm long. It is allied to *A. intermedium* Blume of western Himalaya, but the latter has a much shorter apex (3-6 cm long) of spathe. The type of *A. intermedium* (Jacquemont, no. 1026 in Mus. Paris) has a large brown-purple spathe with an obovate limb abruptly narrowed into a short caudate apex, and somewhat resembles *A. Wallichianum.*

Arisaema concinnum Schott in Bonplandia **7**: 27 (1859); Prodr. 50 (1860)-Hook. f. in Bot. Mag. t. 5914 (1871); Fl. Brit. Ind. **6**: 505 (1893)-Engler in Pfl.-reich IV-23 F, Ht. **73**: 177, f. 36 F (1920)-Chatterjee in Bull. Bot. Soc. Beng. **8**: 122, f. I (1955).

A. affine Schott, l.c. 27 (1859); l.c. 51 (1860).

Kurseong, 1500 m (Apr. 11, 1960, fl.); Takdah, 1600 m (Apr. 18, 1960, fl.); Batasi, 2000 m (May 1 & 2, 1960, fl.); Pamianchi, 2000 m (May 14, 1960, fl.); Gangtok, 1650 m (Jun. 15, 1960, fl.); Darjeeling, 2200 m (Jun. 19 & 20, 1960, fl.).

var. **alienatum** (Schott) Engler, l.c. 178 (1920)-Spring Fl. Sikkim Himal. f. 109 (1963).

A. alienatum Schott, l.c. 26 (1859); Prodr. 45 (1860).

Takdah, 1600 m (Apr. 18 & 19, 1960, no. 2113 & 2140, fl.); Batasi-Palmajua, 2300-2600 m (May 3, 1960, fl.); Tonglu, 2900-3000 m (Jun. 7 & 8, 1960, fl.).

Distr. sp. Himalaya (Simla to NEFA), Khasia, and N. Burma.

Arisaema consanguineum Schott in Bonplandia **7**: 27 (1859); Prodr. 52 (1860)-Fl. Brit. Ind. **6**: 505 (1893)-Engler, l.c. 175, f. 36 A-C (1920)-Chatterjee, l.c. 122 (1955)-Liu et Huang in Quart. Journ. Taiwan Mus. **16**: 131 (1963)-Spring Fl. Sikkim Himal. f. 108 (1963).

A. erubescens var. *consanguineum* (Schott) Engler in DC., Monogr. Phaner. **2**: 558 (1879).

Darjeeling, 2100 m (Apr. 17 & Jun. 21, 24, 1960, fl.); Batasi, 2000 m (May 2, 1960, fl.); Batasi-Palmajua, 2300-2600 m (May 3, 1960, fl.); Rimbick, 2200 m (May 7, 1960, fl.); Khebang, 1700 m (Nov. 19, 1963, fr.).

Distr. Himalaya (Kumaon to Bhutan), Assam, S. Tibet, Manipur, Burma, N. Thai, W. & C. China, and Formosa.

Arisaema exappendiculatum Hara in Journ. Jap. Bot. **40**: 21, f. 1 (1965). [Pl. 8 a–c, Pl. 23]

E. Nepal (1963), cult. in Tokyo (Jul. 4, 1964, fl.—Typus; Jul. 24, 1965 & Jul. 1966, fl.).

This is a very distinct species. Although it resembles *A. concinnum* in the shape of leaves, it is quite different in the shape of spathe, appendage, and stamen from the latter. The limb of spathe is involute on the margin and almost upright, and generally green but rarely dark purple. The stamen bears only one anther which is unilocular and circumscissilely dehiscent at the top. The appendage of spadix is entirely lacking in several living specimens grown in Tokyo in 1964 & 66, but in one plant flowered in 1965, the appendage attaining 1.5 cm long developed [Pl. 8 b]. So this last character seems to vary to some extent.

Arisaema Griffithii Schott, Syn. Aroid. 26 (1856); Prodr. 54 (1860)–Hook. f. in Bot. Mag. t. 6491 (1880); Fl. Brit. Ind. **6**: 499 (1893)–Engl., l.c. 219, f. 53 (1920) –Chatterjee, l.c. 126, f. Z (1955)–Spring Fl. Sikkim Himal. f. 110–112 (1963).

A. Hookerianum Schott in Oester. Bot. Wochenbl. **7**: 334 (1857).

A. Hookeri Schott, Gen. Aroid. t. 6, f. 11–19 (1858).

Senchal–Ghum, 2300–2400 m (Apr. 4 & 6, 1960, fl.); Batasi–Palmajua, 2300–2600 m (May 3, 1960, fl.).

Distr. E. Himalaya (Sikkim).

Arisaema Jacquemontii Blume in Rumphia **1**: 95 (1835)–Jacquemont, Voy. t. 168 (1844)–Engl., l.c. 197, f. 45 A–C (1920)–Chatterjee, l.c. 127, f. B (1955)–Spring Fl. Sikkim Himal. f. 114 (1963).

A. cornutum Schott in Bonplandia **7**: 27 (1859).

Phalut, 3500 m (Jun. 5, 1960, fl.); Phalut–Sandakphu, 3500 m (Jun. 6, 1960, fl.).

Distr. Afghanistan (Kuram), and Himalaya (Kashmir to Sikkim).

Arisaema nepenthoides (Wall.) Martius in Flora **2**: 458 (1831)–Bot. Mag. t. 6446 (1879)–Engler, l.c. 208, f. 49 (1920)–Chatterjee, l.c. 129, f. D (1955)–Spring Fl. Sikkim Himal. f. 106 (1963).

Arum nepenthoides Wall., Tent. Fl. Napal. 26, t. 18 (1824).

Arisaema ochraceum Schott sensu Lacaita in Journ. Linn. Soc. **43**: 483 (1916).

Tonglu, 3000 m (May 7, 1960, fl.); Ramam, 2400 m (May 8, 1960, fl.); Chia Bhanjang–Dentam, 3100–1450 m (May 11, 1960, fl.); Tendong Peak, 2300 m (Mar. 26, 1963, fl.).

Distr. Himalaya (Nepal to Bhutan), Khasia, N. Burma, and W. China (Yunnan).

Arisaema ostiolatum Hara in Journ. Jap. Bot. **36**: 75, f. 1 (1961)–Spring Fl. Sikkim Himal. f. 107 (1963).

Phalut, 3500 m (Jun. 5, 1960, no. 654, fl.—Typus); Phalut–Sabargan, 3500 m (Jun. 6, 1960, fl.).

Distr. Endemic in the Singalila Range.

The species is allied to *A. Wallichianum* var. *sikkimense*, but is clearly distinguishable from the latter in having a hood-shaped limb of spathe which opens on the ventral side only by a roundish aperture about 1 cm in diameter, and is abruptly attenuate to a long caudate apex 3–4.5 cm long.

Arisaema speciosum (Wall.) Martius in Flora **14**: 458 (1831)-Hook. f. in Bot. Mag. t. 5964 (1872); in Fl. Brit. Ind. **6**: 500 (1893)-Engler, l.c. 193 (1920)-Chatterjee, l.c. 135, f. M (1955)-Spring Fl. Sikkim Himal. f. 119 (1963).

Arum speciosum Wallich, Tent. Fl. Napal. 29, t. 20 (1824).

Arisaema eminens Schott in Oester. Bot. Wochenbl. **7**: 357 (1857); Prodr. 30 (1860), e typo.

Darjeeling, 2100 m (Apr. 2 & 8, 1960, fl.); Mani Bhanjang-Batasi, 2000-2100 m (May 1, 1960, fl.); Batasi, 2000 m (May 2, 1960); Palmajua, 2300 m (May 4, 1960, fl.); Rimbick, 2200 m (May 6, 1960, fl.); Peshok, 900 m (Jun. 19, 1960, fr.); Gangtok, 1750 m (Jun. 15, 1960, fl.); Penlong La, 2100 m (Mar. 18, 1963, cult. in Tokyo, May 1964, fl.).

var. **mirabile** (Schott) Hara in Journ. Jap. Bot. **37**: 97 (1962)-Spring Fl. Sikkim Himal. f. 120 (1963).

A. mirabile Schott, l.c. 366 (1857); l.c. 31 (1860), e typo.

Sandakphu-Garibans, 3500-2800 m (Jun. 7, 1960, fl.); Senchal-Tiger Hill, 2400-2500 m (Jun. 23, 1960, fl.).

Distr. sp. E. Himalaya (Nepal to NEFA), N. Assam, and W. China.

The flagelliform appendix of spadix of typical *A. speciosum* is smooth throughout, while that of var. *mirabile* is conspicuously rugose in its thickened middle part. It is noteworthy that the difference between these two races is similar to that between *A. Urashima* Hara and *A. Thunbergii* Blume of Japan.

Arisaema tortuosum (Wall.) Schott, Melet. **1**: 17 (1832)-Engler, l.c. 190, f. 42 (1920)-Chatterjee, l.c. 136, f. W. (1955)-Spring Fl. Sikkim Himal. f. 117 & 118 (1963).

Arum tortuosum Wallich, Pl. Asia. Rar. **2**: 10, t. 114 (1830).

Arisaema helleborifolium Schott, Syn. Aroid. 29 (1856)-Collett, Fl. Siml. 540, f. 178 (1921).

A. tortuosum var. *helleborifolium* (Schott) Engler in DC., Monogr. Phaner. **2**: 545 (1879).

Kurseong, 1500 m (Apr. 12, 1960, bud); Takdah, 1600 m (Apr. 17 & 18, 1960, no. 2139, fl.); Batasi, 2000 m (May 2, 1960, fl.); Rimbick-Ramam, 1900-2400 m (May 7, 1960, fl.); Gangtok, 1600 m (Jun. 13, 1960, fl.); Darjeeling, 2100 m (Jun. 24, 1960, fl.); Dhankuta, 1200 m (Oct. 21, 1963, fr.; cult. in Tokyo, Jul. 27, 1964, fl.).

Distr. sp. Himalaya (Punjab to Sikkim), Khasia, Nilgiris, Manipur, and W. China.

The shape of leaflets is very variable in the species.

Arisaema utile Hooker f. ex Schott, Prodr. 30 (1860); in Bot. Mag. t. 6474 (1880)-Fl. Brit. Ind. **6**: 499 (1893)-Engler, l.c. 218, f. 52 (1920)-Chatterjee, l.c. 137, f. Q (1955)-Spring Fl. Sikkim Himal. f. 115 (1963).

Rimbick, 2200 m (May 7, 1960, fl.); Ramam, 2400 m (May 8, 1960, fl.); Gamothang, 3800 m (May 26 & 27, 1960, no. 520, fl.).

Distr. E. Himalaya.

Arisaema Wallichianum Hooker f. in Fl. Brit. Ind. **6**: 500 (1893)-Engler, l.c. 213 (1920).

A. costatum Mart. sensu O. Stapf in Bot. Mag. sub t. 9058, in adnota (1925)-Chatterjee, l.c. 123, f. U (1955)-Spring Fl. Sikkim Himal. f. 113 & 116 (1963).

Nayathang–Phalut, 3100–3500 m (Jun. 2, 1960, no. 771, fl.).

var. **sikkimense** (Stapf ex Chatterjee) Hara in Journ. Jap. Bot. **40**: 21 (1965).

A. sikkimense Stapf ex Chatterjee in Bull. Bot. Soc. Beng. **3**: 18 (1949); **8**: 135 (1955).

A. costatum var. *sikkimense* (Stapf) Hara in Journ. Jap. Bot. **36**: 76 (1961).

Sandakphu, 3600 m (May 7, 1960, fl.); Jongri, 4000 m (May 24, 1960, fl.).

f. **propinquum** (Schott) Hara, l.c. 21 (1965).

A. propinquum Schott in Oester. Bot. Wochenbl. **7**: 333 (1857).

A. costatum var. *sikkimense* f. *propinquum* (Schott) Hara, l.c. 76 (1961).

Below Phalut, 3000 m (May 9, 1960, no. 170, fl.).

Distr. sp. Himalaya (Kashmir to Sikkim), and S. Tibet.

The plant which agrees well with the type of *Arum costatum* Wallich in the British Museum and also with Wallich's plate in Tent. Fl. Napal. (1824) has recently been collected in Nepal again, and it is quite distinct from *A. Wallichianum*. *A. sikkimense* is considered to be a small subalpine form of *A. Wallichianum*, and *A. propinquum* to be a well-grown form with two leaves.

Gonatanthus pumilus (D. Don) Engler et Krause in Pfl.-reich IV–23 E, Ht. **71**: 19, f. 5 A–M (1920)–Spring Fl. Sikkim Himal. f. 185 (1963).

Caladium pumilum D. Don, Prodr. Fl. Nepal. 21 (1825).

Gonatanthus sarmentosus Klotzsch in Link, Klot. et Otto, Icon. Pl. Rar. **1**: 33 (1841)–Fl. Brit. Ind. **6**: 522 (1893).

Gangtok, 1500 m (Jun. 13 & 15, 1960, fl.); Birch Hill, Darjeeling, 2000 m (Jun. 18, 1960, fl.); Happy Valley, 1900 m (Jun. 26, 1960, fl.); Sunderijal Waterfall, 1600 m (Sep. 20, 1963, bulbil.).

Distr. Himalaya (Simla to Sikkim), Khasia, Manipur, Thai, and W. China.

Lasia spinosa (L.) Thwaites, Enum. Pl. Zeyl. 336 (1864)–Engler in Pfl.-reich IV–23 C, Ht. **48**: 24, f. 9 (1911).

Dracontium spinosum L., Sp. Pl. ed. 1, **2**: 967 (1753).

Lasia heterophylla (Roxb.) Schott, Melet. **1**: 21 (1832)–Fl. Brit. Ind. **6**: 550 (1893).

Ranga Pani–Ghorwa, 300–400 m (Dec. 9, 1963).

Distr. Tropical Himalaya, India, Burma, east to China, and Malaysia.

Pistia Stratiotes L., Sp. Pl. ed. 1, **2**: 963 (1753)–Fl. Brit. Ind. **6**: 497 (1893)–Engler in Pfl.-reich IV–23 F, Ht. **73**: 259 (1920), var. *cuneata* Engl.

Rangali–Biratnagar, 200 m (Dec. 15, 1963).

Distr. Pantropic.

Pothos Cathcarti Schott, Aroid. **1**: 22, t. 44, 45 (1853); Prodr. Aroid. 565 (1860)–Fl. Brit. Ind. **6**: 552 (1894)–Engler in Pfl.-reich IV–23 B, Ht. **21**: 27 (1905).

Rabong La–Temi, lower road, 1200 m (Mar. 28, 1963, fl.); Tuwa–Taplethok, 1800–1400 m (Nov. 5, 1963, bud); Ranga Pani–Ghorwa, 700–300 m (Dec. 9, 1963); Ghorwa–Sanichare, 300–200 m (Dec. 10, 1963).

Distr. Himalaya (Kumaon to Bhutan), Assam, Manipur, Burma and W. China.

Remusatia Hookeriana Schott in Oester. Bot. Wochenbl. **1858**: 133 (1858)–Fl. Brit. Ind. **6**: 522 (1893)–Engler et Krause in Pfl.-reich IV–23 E, Ht. **71**: 18, f. 4, N–T (1920).

Senchal–Takdah, 2000 m (Apr. 16, 1960, fl.); Rimbick, 2200 m (May 7, 1960, fl.); Ramam, 2400 m (May 8, 1960, fl.); Dentam–Pamianchi, 1400–2000 m (May

12, 1960); Taplejung–Garhi Danra, 1900–2200 m (Nov. 3, 1963, bulbil.); below Siling Tzokupa, 2100 m (Nov. 20, 1963, fr.); Mai Majuwa–Dhara Pani, 1500 m (Dec. 4, 1963, bulbil.).

Distr. Himalaya (Simla to Sikkim).

Remusatia vivipara (Lodd.) Schott, Melet. **1**: 18 (1832)–Fl. Brit. Ind. **6**: 521 (1893)–Engler et Krause, l.c. 16, f. 4, A–M (1920).

Caladium viviparum Loddiges, Bot. Cat. **3**: t. 281 (1818).

Saramsa, 1100 m (Mar. 21, 1963, fl.); Gokarna, Kathmandu, 1500 m (Sep. 22, 1963, bulbil.); Tuwa–Taplethok, 1800-1400 m (Nov. 5, 1963, bulbil.); Yektin, 1400 m (Nov. 29, 1963, bulbil.).

Distr. W. Africa, Himalaya, India, Ceylon, Indo-China, and Java.

Rhaphidophora decursiva (Roxb.) Schott in Bonpl. **5**: 45 (1857)–Fl. Brit. Ind. **6**: 547 (1893)–Engl. et Krause in Pfl.-reich IV–23 B, Ht. **37**: 52 (1908).

Pothos decursiva Roxburgh, Fl. Ind. ed. Carey, **1**: 456 (1820)–Wallich, Pl. Asia. Rar. **2**: 83, t. 192 (1831).

Yoksam–Bakkim, 1700–2200 m (May 18, 1960, fl.).

Distr. E. Himalaya (Kumaon to Sikkim), Assam, Ceylon, Manipur, Burma, Indo-China, and W. China.

Rhaphidophora glauca (Wall.) Schott in Bonpl. **5**: 45 (1857)–Fl. Brit. Ind. **6**: 547 (1893)–Engl. et Krause, l.c. 47 (1908).

Pothos glaucus Wallich, Pl. Asia. Rar. **2**: 45, t. 156 (1831).

Yoksam, 1700 m (May 17, 1960, fl.); Tuwa–Taplethok, 1800–1400 m (Nov. 5, 1963, fl.); Helok–Iladanda, 1500–1800 m (Nov. 8 & 13, 1963, fl.); Ghatte, 1600 m (Nov. 17, 1963, fl.); Ghatte–Khebang (Nov. 19, 1963, fl.); Gangtok, 1500 m (Mar. 18, 1963, fl.).

Distr. E. Himalaya (Nepal, Sikkim), Khasia, Naga Hills, and Manipur.

Rhaphidophora Hookeri Schott in Bonpl. **5**: 45 (1857)–Fl. Brit. Ind. **6**: 546 (1893)–Engl. et Krause, l.c. 32 (1908).

Singtam–Gangtok, 700 m (Mar. 29, 1963, fl.).

Distr. E. Himalaya (Sikkim), N. Assam, Khasia, and Manipur.

Scindapsus officinalis (Roxb.) Schott, Melet. **1**: 21 (1832)–Fl. Brit. Ind. **6**: 541 (1893)–Engler et Krause in Pfl.-reich IV–23 B, Ht. **37**: 73, f. 30 A–G (1908).

Pothos officinalis Roxburgh, Fl. Ind. ed. Carey, **1**: 452 (1820).

Lookya Mai–Ghorwa, 300–400 m (Dec. 9, 1963, fr.); Ghorwa–Sanichare, 300–200 m (Dec. 10, 1963).

Distr. Tropical Himalaya, India, Burma, and Indo-China.

Thomsonia napalensis Wallich, Pl. Asia. Rar. **1**: 83, t. 99 (1830)–Fl. Brit. Ind. **6**: 518 (1893)–Bot. Mag. t. 7342 (1894)–Engler in Pfl.-reich IV–23 C, Ht. **48**: 56, f. 22 (1911).

Amorphophallus chlorospathus Kurz sensu Spring Fl. Sikkim Himal. f. 216 & 217 (1963).

Kalimpong, 1300 m (Apr. 25, 1960, fl.); Tingling Bridge below Yoksam, 1000 m (May 16, 1960, fl.); below Illam, 1200–400 m (Dec. 8, 1963; cult. in Tokyo, Jul. 17, 1964, fl.).

Distr. E. Himalaya (Nepal, Sikkim), Khasia, Assam, and Naga Hills.

LEMNACEAE (by Hiroshi Hara)

Lemna perpusilla Torrey, Fl. New York **2**: 245 (1843)-Daubs in Illinois Biol. Monogr. **34**: 25, t. 9 (1965).

L. paucicostata Hegelmaier, Lemnac. 139, t. 8 (1868)-Fl. Brit. Ind. **6**: 556 (1893).

Below Siling Tzokupa-Khebang, 2000-1700 m (Nov. 22, 1963); Bharomdin-Tharpu, 1000-1200 m (Nov. 25, 1963).

Distr. Widely distributed in tropical and temperate regions.

Wolffia arrhiza (L.) Horkel ex Wimmer, Fl. Schles. 140 (1857)-Fl. Brit. Ind. **6**: 557 (1893)-Daubs, l.c. 48 (1965).

Lemna arrhiza L., Mant. Pl. **2**: 294 (1771).

Kathmandu, in pond, 1400 m (Sep. 17, 1963).

Distr. Widely distributed in tropical and temperate regions of the Old World.

COMMELINACEAE (by Hiroshi Hara)

Amischophacelus axillaris (L.) Rolla Rao et Kammathy in Journ. Linn. Soc. **59**: 306 (1966).

Commelina axillaris L., Sp. Pl. ed. 1, **1**: 42 (1753).

Cyanotis axillaris (L.) J. A. et J. H. Schultes, Syst. Veg. **7**: 1154 (1830)-Clarke, Commel. & Cyrt. Beng. t. 35 (1874)-Fl. Brit. Ind. **6**: 388 (1892).

Sibganja-Gauriganja, 200 m (Dec. 12, 1963, fr.).

Distr. Himalaya, India, east to China, Malaysia, and Australia.

Amischotolype Hookeri (Hassk.) Hara, comb. nov.

Forrestia Hookeri Hassk. in Flora **1864**: 629 (1864)-Clarke, Commel. & Cyrt. Beng. t. 41 (1874)-Fl. Brit. Ind. **6**: 384 (1892).

Ghorwa-Sanichare, 300-200 m (Dec. 10, 1963, fr.).

Distr. E. Himalaya (E. Nepal to NEFA), Khasia, Naga Hills, Manipur, Burma, and Indo-China.

Forrestia A. Rich. (1834) is a later homonym of *Forrestia* Rafin. (1806), as pointed out by Pichon (1946).

Aneilema scaberrimum (Blume) Kunth, Enum. Pl. **4**: 69 (1843)-Fl. Brit. Ind. **6**: 382 (1892)-Rolla Rao in Not. Bot. Gard. Edinb. **25**: 182 (1964).

Commelina scaberrima Blume, Enum. Pl. Java. **1**: 4 (1827).

Dictyospermum protensum Wight, Icon. **6**: 30, t. 2071 (1853).

Aneilema protensum Wall. ex Thwait., Enum. Pl. Zeyl. 322 (1864)-Clarke, l.c. t. 24 (1874).

A. divergens Clarke sensu Hayata, Fl. Mont. Formos. 228 (1908)-Masamune in Journ. Geobot. (Hokuriku) **7**: t. 3 (1958).

Nissim-Dumhan, 1200 m (Oct. 30, 1963, fr.); Taplejung-Garhi Danra, 1900-2200 m (Nov. 3, 1963, fr.); Garhi Danra-Tuwa, 2200-1800 m (Nov. 4, 1963, fr.); Tuwa-Taplethok, 1800-1400 m (Nov. 5, 1963, fr.); below Siling Tzokupa-Khebang, 2100-1700 m (Nov. 22, 1963, fr.).

Distr. Himalaya (Nepal to NEFA), Khasia, Manipur, W. Ghats, Ceylon, east to China and Formosa, and Malaysia.

Commelina benghalensis L., Sp. Pl. ed. 1, **1**: 41 (1753)-Clarke, l.c. t. 4 (1874)-Fl. Brit. Ind. **6**: 370 (1892).

Kathmandu, 1400 m (Oct. 13, 1963, fl.); Dhankuta, 1200 m (Oct. 19 & 21, 1963, fl.); Nissim–Dumhan, 900 m (Oct. 30, 1963, fr.).

Distr. Africa, Himalaya, India, east to China and C. & S. Japan, and Malaysia.

Commelina diffusa Burman f., Fl. Ind. 18, t. 7, f. 2 (1768)–Merrill in Journ. Arn. Arb. **18**: 64 (1937)–Rolla Rao in Not. Bot. Gard. Edinb. **25**: 179 (1964).

C. communis L. sensu Clarke, l.c. t. 1 (1874).

C. nudiflora L. sensu Clarke in DC., Monog. Phan. **3**: 144 (1881)–Fl. Brit. Ind. **6**: 369 (1892).

Dumhan, 700 m (Oct. 31, 1963, fr.); Tharpu–Chyangthaphu, 1200–1300 m (Nov. 26, 1963, fr.).

Distr. Pantropic and warm-temperate regions.

Commelina Hasskarlii C. B. Clarke, Commel. & Cyrt. Beng. 13, t. 3 (1874) –Fl. Brit. Ind. **6**: 370 (1892).

Kathmandu, 1400 m (Oct. 13, 1963, fr.); Biratnagar, 200 m (Oct. 14, 1963, fr.); Dhankuta, 1200 m (Oct. 21, 1963, fr.); Bharomdin–Tharpu, 700–1200 m (Nov. 25, 1963, fr.).

Distr. Himalaya, Assam, south to Deccan Pen.

The plants resemble a small form of *C. longifolia* Lam. (*C. salicifolia* Roxb.), and need further critical studies.

Commelina paludosa Blume, Enum. Pl. Java **1**: 2 (1827)–Rolla Rao in Not. Bot. Gard. Edinb. **25**: 181 (1964).

C. obliqua (non Vahl 1806) Hamilton ex D. Don, Prodr. Fl. Nepal. 45 (1825)–Clarke, l.c. t. 9 (1874)–Fl. Brit. Ind. **6**: 372 (1892).

Dhara Pani–Dhankuta, 300 m (Oct. 17, 1963, fl. lilac); Sinduwa, 2100 m (Oct. 23, 1963, fl.); Tuwa–Taplethok, 1800–1400 m (Nov. 5, 1963, fl.); below Siling Tzokupa–Khebang, 2100–1700 m (Nov. 22, 1963, fr.); Ghorwa–Sanichare, 300–200 m (Dec. 10, 1963, fr.).

var. **viscida** (Clarke) Rolla Rao et Kammathy in Bull. Bot. Surv. India **3**: 168 (1962)–Rolla Rao, l.c. 181 (1964).

C. obliqua var. *β viscida* Clarke, l.c. 19, t. 10 (1874).

Sunderijal Waterfall, Kathmandu, 1600 m (Sep. 20, 1963, fr.).

Distr. sp. Himalaya, India, Ceylon, Burma, east to China and Formosa, and Malaysia.

Cyanotis cristata (L.) D. Don, Prodr. Fl. Nepal. 46 (1825), in nota–Clarke, l.c. t. 36 (1874)–Fl. Brit. Ind. **6**: 385 (1892).

Commelina cristata L., Sp. Pl. ed. 1, **1**: 42 (1753).

Chovar Gorge, Kathmandu, 1200 m (Sep. 21, 1963, fr.); Sanguri Bhanjang, 600–1200 m (Oct. 16, 1963, fl.); Ranga Pani–Ghorwa, 700–300 m (Dec. 9, 1963, fl.).

Distr. Tropical Africa, Himalaya, India, east to China, and Malaysia.

Cyanotis vaga (Lour.) J. A. et J. H. Schultes, Syst. Veg. **7**: 1153 (1830)–Merrill in Trans. Amer. Philos. Soc. n. s. **24** (2): 102 (1935)–Rolla Rao in Not. Bot. Gard. Edinb. **25**: 186 (1964).

Tradescantia vaga Loureiro, Fl. Cochinch. **1**: 193 (1790).

Cyanotis barbata D. Don, Prodr. Fl. Nepal. 46 (1825)–Clarke, l.c. t. 37 (1874)–Fl. Brit. Ind. **6**: 385 (1892).

Derjeeling, 2150 m (cult. in Tokyo, Sep. 30, 1963, fl.; Sep. 11, 1964, fl.); Godavari, Kathmandu, 1500 m (Sep. 18, 1963, fl.); Phusri–Dhara Pani, 500–1200 m (Oct. 16, 1963).

Distr. N. Africa, C. Asia, Himalaya, Khasia, Burma, east to China.

Floscopa scandens Loureiro, Fl. Cochinch. **1**: 193 (1790)–Fl. Brit. Ind. **6**: 390 (1892).

Tradescantia paniculata Roxb., Pl. Corom. **2**: 6, t. 109 (1799).

Dithyrocarpus paniculatus (Roxb.) Kunth, Enum. Pl. **4**: 70 (1843)–Clarke, l.c. t. 34 (1874).

Nissim–Dumhan, 900 m (Oct. 30, 1963, fr.); Dumhan–Taplejung, 1000–1900 m (Oct. 31, 1963, fl. dull red-purple); Tuwa–Taplethok, 1800–1400 m (Nov. 5, 1963, fr.); Taplethok–Helok, 1400–1500 m (Nov. 6, 1963, fr.); Ranga Pani–Ghorwa, 700–300 m (Dec. 9, 1963, fr.).

Distr. Himalaya, India, east to China and Formosa, and south to Malaysia, and Australia.

Murdannia Blumei (Hassk.) Brenan in Hook., Icon. Pl. t. 3578 (1962)–Rolla Rao in Not. Bot. Gard. Edinb. **25**: 183 (1964).

Dichoespermum Blumei Hassk., Commel. Ind. 41 (1870)–Clarke, l.c. t. 27 (1874).

Aneilema Hamiltonianum Wall. ex Clarke in DC., Monogr. Phan. **3**: 213 (1881)–Fl. Brit. Ind. **6**: 380 (1892).

Kathmandu, 1400 m (Oct. 13, 1963, fr.).

Distr. Himalaya, India, Burma, and Malaysia.

Murdannia elata (Vahl) Brückner in Engl., Pfl.-fam. ed. 2, **15 a**: 173 (1930).

Commelina elata Vahl, Enum. **2**: 178 (1806).

Commelina herbacea Roxb., Fl. Ind. ed. Carey, **1**: 179 (1820).

Commelina lineolata Blume, Enum. Pl. Java. **1**: 3 (1827).

Aneilema herbaceum (Roxb.) Wallich, Cat. no. 5223 (1830)–Clarke in Journ. Linn. Soc. **11**: 448 (1870).

Aneilema lineolatum (Blume) Kunth, Enum. Pl. **4**: 69 (1843)–Clarke, l.c. t. 15 (1874)–Fl. Brit. Ind. **6**: 376 (1892).

Siliguri, 200 m (Jun. 29, 1960, fr.); Ranga Pani–Ghorwa, 700–300 m (Dec. 9, 1963).

Distr. Tropical Himalaya (Nepal to Bhutan), Khasia, W. Ghats, Burma, east to China, and Malaysia.

Murdannia nudiflora (L.) Brenan in Kew Bull. **1952**: 189 (1952).

Commelina nudiflora L., Sp. Pl. ed. 1, **1**: 41 (1753), p.p., excl. syn.; Mant. Pl. **2**: 177 (1771).

Tradescantia malabarica L., Sp. Pl. ed. 2, 412 (1762).

Aneilema nudiflorum (L.) Wallich, Cat. no. 5224 (1830)–Clarke, l.c. t. 21 (1874)–Fl. Brit. Ind. **6**: 378 (1892)–Merrill in Journ. Arn. Arb. **18**: 65 (1937).

Murdannia malabaricum (L.) Brückner in Engl., Pfl.-fam. ed. 2, **15a**: 173 (1930).

Ratong Chu, 1000 m (May 16, 1960, fr.); Rangpo–Tista, 350-300 m (Jun. 18, 1960, fr.); Gokarna Forest, Kathmandu, 1500 m (Sep. 22, 1963, fr.); Kathmandu–Thankot, 1300 m (Sep. 19, 1963, fr.); Biratnagar, 200 m (Oct. 14, 1963, fr.); Dumhan, 700 m (Nov. 1, 1963, fr.); Namli, 900 m (Sep. 12, 1964, fl. mauve).

Distr. Africa, Himalaya, India, Burma, east to China and S. Japan, and Malaysia.

Murdannia spirata (L.) Brückner in Engl.,Pfl.-fam. ed. 2, **15 a**: 173 (1930), ut *spiratum.*

Commelina spirata L., Mant. Pl. **2**: 176 (1771).

Aneilema spiratum (L.) R. Brown, Prodr. Nov. Holl. 271 (1810)–Fl. Brit. Ind. **6**: 377 (1892).

A. nanum (Roxb.) Kunth, Enum. **4**: 65 (1843)–Clarke, l.c. t. 18 (1874).

Kathmandu, 1400 m (Sep. 17, 1963, fl.); Biratnagar, 200 m (Oct. 14, 1963, fr.); Nissim–Dumhan, 700-900 m (Oct. 30 & 31, 1963, fr.); Khebang-Bharomdin, 1700–1000 m (Nov. 24, 1963, fr.).

Distr. Himalaya, India, east to China and Formosa, and Malaysia.

Streptolirion volubile Edgeworth in Proc. Linn. Soc. **1**: 254 (1845); in Trans. Linn. Soc. **20**: 90, t. 2 (1846)–Clarke, l.c. t. 40 (1874)–Fl. Brit. Ind. **6**: 389 (1892)–Forman in Kew Bull. **16**: 212 (1962).

Tradescantia cordifolia (non Swartz 1788) Griff., Priv. Journ. 208 (1847).

Streptolirion cordifolium (Griff.) O. Kuntze, Rev. Gen. Pl. **2**: 722 (1891).

Darjeeling, 2100 m (Jun. 24, 1960, fl.); Mai Majuwa–Dhara Pani, 1500-1900 m (Dec. 4, 1963, fr.); Lagyap, 2200 m (Sep. 13, 1964, fl.).

Distr. Himalaya (Garhwal to Bhutan), Khasia, Manipur, N. Burma, east to China and W. Japan.

PONTEDERIACEAE (by Hiroshi Hara)

Eichhornia crassipes (Mart.) Solms in A. DC., Monogr. Phan. **4**: 527 (1883) –Fl. Males. **4**: 259 ((1951).

Pontederia crassipes Mart., Nov. Gen. Sp. 9, t. 4 (1823).

Nissim–Dumhan, 900 m (Oct. 30, 1963, fl.); Ghorwa–Sanichare, 200 m (Dec. 10, 1963, fl.).

Distr. Brazil; naturalized in tropical Asia.

Monochoria vaginalis (Burm. f.) Presl, Rel. Haenk. **1**: 128 (1827)–Fl. Brit. Ind. **6**: 363 (1892)–Fl. Males. **4**: 256 (1951).

Pontederia vaginalis Burm. f., Fl. Ind. 80 (1768).

Pontederia plantaginea Roxb., Fl. Ind. ed. 2, **2**: 123 (1832).

Gokarna, Kathmandu, 1500 m (Sep. 22, 1963, fl.); Biratnagar, 200 m (Oct. 14, 1963, fl., fr.); Taplejung, 1900 m (Nov. 1, 1963, fl., fr.).

Distr. Himalaya, India, east to China and Japan, and Malaysia.

JUNCACEAE (by Yoshisuke Satake)

Juncus Clarkei Buchenau in Engl., Bot. Jahrb. **6**: 210, t. 2 (1885)–Fl. Brit. Ind. **6**: 400 (1894).

Gamothang (May 27 & 29, 1960, fr.).

Distr. E. Himalaya (Sikkim, Bhutan), and Assam.

Juncus effusus L., Sp. Pl. ed. 1, 326 (1753)–Fl. Brit. Ind. **6**: 392 (1894).

Yoksam, 1700 m (May 16, 1960, fr.).

Distr. Europe, Asia, Africa, Australia, and America.

Juncus Grisebachii Buchenau in Abh. Nat. Ver. Brem. **3**: 295 (1873)–Fl. Brit. Ind. **6**: 394 (1894).

Sandakphu, 3600 m (Sep. 16, 1964, fr.); Ramam-Phalut, 2400–3500 m (May 9, 1960, fr.).

Distr. E. Himalaya (Sikkim, and Bhutan).

Juncus Leschenaultii Gay in Laharpe, Monogr. Jonc. 137 (1827).

Juncus prismatocarpus R. Br. sensu Hook. f., Fl. Brit. Ind. **6**: 395 (1894), p.p.

Takdah, Darjeeling, 1700 m (Apr. 19, 1960, fl.); Rayang, 250 m (Apr. 20, 1960, fr.); Palmajua-Rimbick, 2300–2200 m (May 5, 1960, fr.).

Distr. India, China, Formosa, Ryukyu, Korea, and Japan.

Juncus leucanthus Royle ex D. Don in Trans. Linn. Soc. **18**: 318 (1840)–Fl. Brit. Ind. **6**: 397 (1894).

Jongri–Olothang, 3900–4000 m (May 23, 1960, fl.); Jongri–Gamothang, 4000–3750 m (May 26, 1960, fl.); Gamothang, 3750 m (May 29, 1960, fl.); Migothang-Nayathang, 3900–3300 m (Jun. 1, 1960, fl.); Nayathang-Chia Bhanjang, 3300–3100 m (Jun. 2, 1960, fl.).

Distr. Himalaya (Sikkim).

Juncus leucomelas Royle ex Don in Trans. Linn. Soc. **18**: 320 (1840)–Fl. Brit. Ind. **6**: 397 (1894).

Migothang, 3900 m (May 31, 1960, fr.).

Distr. Himalaya (Kashmir to Sikkim), and Tibet.

Juncus membranaceus Royle ex Don in Trans. Linn. Soc. **18**: 317 (1840)–Fl. Brit. Ind. **6**: 397 (1894).

Jongri, 4000 m (May 23, 1960, fr.).

Distr. Himalaya (Kashmir to Sikkim).

Juncus monticola Steudel, Syn. Fl. Glum. **2**: 301 (1855)–Hara in Journ. Jap. Bot. **20**: 332 (1944).

Juncus prismatocarpus R. Br. sensu Hook. f., Fl. Brit. Ind. **6**: 395 (1894), p.p.

Juncus Koidzumii Satake in Journ. Jap. Bot. **12**: 89 (1936).

Hati Sar–Minchin Dhap, 2700–2800 m (Oct. 28, 1963, fl. & fr.); Minchin Dhap-Mul Pokhari, 2800–2400 m (Oct. 29, 1963, fl. & fr.).

Distr. India, Ryukyu, and Japan.

Juncus ochraceus Buchenau in Abh. Nat. Ver. Brem. **3**: 292 (1872)–Fl. Brit. Ind. **6**: 394 (1894).

Ghum, 2300 m (Apr. 4, 1960, fr.).

Distr. E. Himalaya (Sikkim, Bhutan), and Assam.

This is an extraordinary rush in appearance. The heads are all or partly reduced to sterile spikelets consisting of bracts and glumaceous tepals, and one or two perfect flowers are developed at the second axil of a head. The fruit was matured, but seeds are not seen.

Juncus sphacelatus Decne. in Jacquemont, Voy. Inde **4**: 172, t. 172 (1844) -Fl. Brit. Ind. **6**: 398 (1894).

Gamothang 3800 m (May 27, 1960, fr.); Jongri–Olothang, 3900–4300 m (May 23, 1960, fr.); Jongri-Gamothang, 3600–4200 m (May 26, 1960, fr.).

Distr. Afghanistan, and Himalaya (Kashmir to Sikkim).

Juncus sphenostemon Buchenau in Engl., Bot. Jahrb. **6**: 223, t. 3 (1885) et Junc. 230, f. 107 (1906).

Sandakphu, 3600 m (Sep. 16, 1964, fr.).

Bilbatay Bhanjang–Hati Sar, 2200–2700 m (Oct. 27, 1963, fr.); Baroya Khimty-Thakma Khola, 2500–3100 m (Nov. 12, 1963, fr.).

Distr. Himalaya (Kashmir to Sikkim).

Juncus triglumis L., Sp. Pl. ed. 1, 328 (1753)–Fl. Brit. Ind. **6**: 396 (1894).

Jongri–Olothang, 4300 m (May 23, 1960, fr.); along the Choktsering Chu, North of Jongri, 4000–4500 m (May 25, 1960, fr.).

Distr. Kashmir, Himalaya, Tibet, Japan, and arctic alpine N. Hemisphere.

Juncus Wallichianus Laharpe, Monogr. Jonc. 139 (1827).

Juncus prismatocarpus R. Br. sensu Hook. f., Fl. Brit. Ind. **6**: 395 (1894), p.p.

Kalimpong, 1300 m (Jun. 19, 1960, fl.); Ghum–Kurseong, 2200 m (Jun. 29, 1960, fl. and fr.).

Distr. India, China, Formosa, Ryukyu, Japan, Korea, and Manchuria.

Luzula rostrata Buchenau, Junc. 47, f. 39 (1906).

subsp. **darjeelingensis** Satake, subsp. nov. [Fig. 25]

Similis *Luzulae rostratae*, sed planta robusta, 25–35 cm alta. Inflorescentia magna multiflora. Fructus subtrigono-ovatus, apice subobtusus breve mucronatus, tepala aequans vel paulo superans. Stamina et semina ut in typo.

Rimbick–Ramam, 1900–2400 m (May 7, 1960—Holotypus in Tl); Garibans–Tonglu, 2800–3000 m (Jun. 7, 1960).

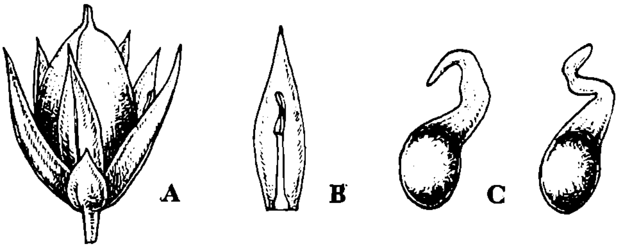

Fig. 25 *Luzula rostrata* subsp. *darjeelingensis* Satake.
A. Capsule with tepals. B. Outer tepal with stamen.
C. Seeds. All ×6.6.

Perennial, caespitose, 25–35 cm high. Radical leaves linear, about 15 cm long, 4–5 mm broad, sparsely ciliate with long hairs; cauline leaves 2, much shorter and narrower than the radical leaves; apices of leaves callose. Inflorescence many-flowered. Bracts ovate, acute, ciliate at margin, much shorter than the flowers. Tepals lanceolate, acuminate, equal in length, 2–2.5 mm long. Stamens 6, shorter than the tepals; anthers oblong, much shorter than the filaments. Capsules ovate, subobtuse and mucronate at the apex, as long as or a little longer than the tepals. Seeds ellipsoid, 1–1.3 mm long, with horn-like caruncles a little longer than the seeds.

It is very interesting that *Luzula rostrata* hitherto known only from Japan was collected in Darjeeling.

Luzula sudetica DC., Fl. Franc. **6**: 306 (1815).

Phalut, (May 9 & Jun. 4–5, 1960, fl.); Nayathang–Phalut, 3300–3600 m (Jun. 2, 1960, fl.); Garibans–Tonglu, 2800–3000 m (Jun. 7, 1960, fl.).

Distr. Eurasia, Japan, and North America.

All specimens are of flowers with neither capsule nor seed, and determination is rather difficult.

LILIACEAE (by Hiroshi Hara, *Smilax* by Tetsuo Koyama)

Aletris gracilis Rendle in Journ. Bot. **44**: 41 (1906).

Siling Tzokupa, 3000 m (Nov. 21, 1963, fr.; cult. in Tokyo and Karuizawa, May–Jul. 1964, fl.).

Distr. E. Himalaya (E. Nepal, Sikkim, Bhutan), and S. Tibet?

Aletris pauciflora (Klotzsch) Hand.-Mzt., Symb. Sin. **7**: 1220 (1936).

Stachypogon pauciflorus Klotzsch in Bot. Erg. Waldemar 49, t. 94 (1862).

Aletris nepalensis Hook f., Fl. Brit. Ind. **6**: 264 (1892).

Choktsering Chu, Jongri, 4000–4500 m (May 25, 1960, fl.); Gamothang, 3750 m (May 26 & 27, 1960, no. 564, fl.).

Distr. Himalaya (Kashmir to Bhutan), and W. China.

Aletris sikkimensis Hook. f., Fl. Brit. Ind. **6**: 265 (1892)–Kitamura in Act. Phytotax. Geobot. **20**: 38 (1962)

Diorali Bhanjang, 3400 m (Nov. 14 & 17, 1963, fr.).

Distr. E. Himalaya (Nepal to Bhutan), W. China, Formosa, and Korea.

Allium chinense G. Don, Monogr. Allium 83 (1827)–Stearn in Bull. Brit. Mus. Bot. **2**: 174 in adnota (1960)–Mann et Stearn in Econ. Bot. **14**: 80 (1960).

A. Bakeri Regel in Act. Hort. Petrop. **3**: 341 (1875)–Fl. Brit. Ind. **6**: 341 (1892).

Darjeeling Bazar (1960), cult. in Tokyo (Nov. 3, 1963, fl.).

Distr. China. Cultivated in China, Japan, Khasia, and E. Himalaya.

Allium Prattii C. H. Wright ex Forbes et Hemsl. in Journ. Linn. Soc. **36**: 124 (1903)–Hand.-Mzt., Symb. Sin. **7**: 1196 (1936)–Stearn in Herbertia **12**: 79 (1947); in Bull. Brit. Mus. Bot. **2**: 171, f. 7 (1960).

A. Victorialis var. *angustifolium* Hook. f., Fl. Brit. Ind. **6**: 343 (1892).

A. Prattii var. *ellipticum* Wang et Tang in Bull. Fan Mem. Inst. **7**: 297(1937).

Gamothang, 3750 m (May 27 & 28, 1960, bud); Jongri–Gamothang, 4000–3750 m (May 26, 1960, bud); Gamothang–Migothang, 3750–3900 m (May 30, 1960, bud).

Distr. Himalaya (Easternmost Kumaon to NEFA), E. Tibet, N. Burma, and W. & C. China.

Allium Wallichii Kunth, Enum. Pl. **4**: 443 (1843)–Fl. Brit. Ind. **6**: 341 (1892)–Stearn in Bull. Brit. Mus. Bot. **2**: 182, f. 8 (1960).

Hati Sar–Minchin Dhap, 2700–2900 m (Oct. 28, 1963, fr.).

Distr. Himalaya (Simla to NEFA), S. E. Tibet, and N. Burma.

Asparagus filicinus Hamilton ex D. Don, Prodr. Fl. Nepal. 49 (1825)–Baker in Journ. Linn. Soc. **14**: 605 (1875).

var. **brevipes** Baker, l.c. (1875)–Fl. Brit. Ind. **6**: 314 (1892), ut var. *brevifipes*.

Yoksam, 1700 m (May 17, 1960, no. 342, fl.); Kakani, 2100 m (Sep. 24, 1963, fr.); Ghatte–Khebang, 1600–2400 m (Nov. 19, 1963).

Distr. sp. Himalaya (Kashmir to Bhutan), Assam, Manipur, Burma, Thai, Indo-China, and W. China.

Asparagus racemosus Willdenow, Sp. Pl. **2**: 152 (1799)–Baker, l.c. 623 (1875)–Fl. Brit. Ind. **6**: 316 (1892).

Dhankuta, 1200 m (Oct. 20, 1963); Dumhan–Taplejung, 800–1900 m (Nov. 1, 1963, fl.); Garhi Danra–Tuwa, 2200–1800 m (Nov. 4, 1963, fl.); Tuwa–Taplethok, 1800–1400 m (Nov. 5, 1963, fr.); Bharomdin–Tharpu, 800–1200 m (Nov. 25, 1963, fr.); Tharpu, 1200 m (Nov. 26, 1963, fr.).

The cladodes are variable in length, and are 6–32 mm long.

var. **subacerosus** Baker, l.c. 624 (1875).

Ranga Pani–Ghorwa, 700–300 m (Dec. 9, 1963, fr.); Ghorwa–Sanichare, 300–200 m (Dec. 10, 1963, fr.).

Distr. sp. Himalaya (Kashmir to Sikkim), south to Ceylon, Malaysia, Australia, and Africa.

Campylandra aurantiaca (Wall.) Baker in Journ. Linn. Soc. **14**: 582, t. 20 (1875).

Tupistra aurantiaca Wallich, Cat. no. 5194 (1831–32), nom. nud.–Fl. Brit. Ind. **6**: 325 (1892).

Victoria Fall, Darjeeling, 2000 m (Apr. 10, 1960, fl.); Batasi, 2000 m (May 2, 1960, fl. & fr.); Yoksam–Bakkim, 1700–2100 m (May 18, 1960, fl.); Damthang–Temi, 2200–1800 m (Mar. 25, 1963, fl.); Damthang–Rabong La, 2200 m (Mar. 28, 1963, fl.); Sinduwa, 2100 m (Oct. 24, 1963, bud); Bilbatay Bhanjang, 2200 m (Oct. 25, 1963, bud); above Tutay, 2700 m (Oct. 26, 1963, fr.); Lelep, 2500 m (Nov. 9, 1963); Zongi-Iladanda (Nov. 12, 1963, fr.); Birwa–Yektin, 2900–1600 m (Nov. 28, 1963, fl.).

Distr. E. Himalaya (Nepal to Bhutan), Mishmi, Naga Hills, Khasia, and W. China.

Cardiocrinum giganteum (Wall.) Makino in Bot. Mag. Tokyo **27**: 125 (1913)–Woodcock et Stearn, Lilies of World 370, phot., fig. (1950)–Kanai in Journ. Fac. Sci. Univ. Tokyo Bot. **8**: 323 (1963)–Spring Fl. Sikkim Himal. f. 169 (1963).

Lilium giganteum Wallich, Tent. Fl. Napal. 21, t. 12 & 13 (1824), excl. syn.–Fl. Brit. Ind. **6**: 349 (1892).

Darjeeling, 2200 m (Jun. 24, 1960, young fr.); Thakma Khola, 3000 m (Nov. 13, 1963, fr.); Bharomdin–Tharpu, 900–1200 m (Nov. 25, 1963, fr.).

Distr. E. Himalaya (Simla to NEFA), S. Tibet, Khasia, Manipur, and N. Burma.

The closely allied species, *C. cordatum* (Thunb.) Makino including var. *Glehni* (Fr. Schm.) Hara, is distributed widely in Japan, and Saghalin. Its leaves are crowded near the middle of its stem, and its flowers are zygomorphous and are different in shape from those of *C. giganteum*. It is noteworthy that *C. giganteum* is difficult to cultivate in Japan. *C. cathayanum* (Wilson) Stearn of China seems to be nearer to *C. cordatum* than to *C. giganteum*.

Chlorophytum arundinaceum Baker in Journ. Linn. Soc. **15**: 323 (1876)–Fl. Brit. Ind. **6**: 333 (1892).

Sanguri Bhanjang, 1200 m (Oct. 16, 1963, fr.); Dhankuta, 1200 m (Oct. 18–21, 1963, fr; cult. in Tokyo, Sep. 11, 1965, fl.).

Distr. Himalaya (Nepal to Bhutan), India, and Burma.

This species is clearly distinguished from *C. nepalense* in having often simple denser-flowered inflorescences, ascending (not nodding) flowers, and longer obovate capsules.

Chlorophytum breviscapum Dalzell in Hook. Journ. Bot. Kew Misc. **2**: 141

(1850)–Fl. Brit. Ind. **6**: 333 (1892).

Near Siliguri, 300 m (Jun. 29, 1960, fl.); Ranga Pani–Ghorwa, 700–300 m (Dec. 9, 1963, fr.).

Distr. Tropical Himalaya, India, and Burma.

Chlorophytum nepalense (Lindl.) Baker in Journ. Linn. Soc. **15**: 330 (1876).

Phalangium nepalense Lindley in Trans. Hort. Soc. Lond. **6**: 277 (1826).

Chlorophytum undulatum Wallich, Cat. no. 5059 (1831–32), nom. nud.–Fl. Brit. Ind. **6**: 335 (1892).

Kakani, 2100–2200 m (Sep. 24, 1963, fl.); Sinduwa, 2100 m (Oct. 24, 1963, fr.); Bilbatay Bhanjang, 2200 m (Oct. 25, 1963, fr.); above Tutay, 2600 m (Oct. 26, 1963, fl.); Garhi Danra–Tuwa, 2200–1800 m (Nov. 4, 1963, fr.); Khebang, 1400 m (Nov. 23, 1963, fr.); Halhale Bhanjang, 2700 m (Dec. 1, 1963, fr; cult. in Tokyo, 1964, fl.).

Distr. E. Himalaya (Nepal, Sikkim).

Clintonia udensis Trautvetter et Meyer, Fl. Ochot. 92, t. 30 (1856)–Hara in Bot. Mag. Tokyo **52**: 460 (1938).

C. alpina var. *udensis* (Trautv. et Mey.) Macbride in Contr. Gray Herb. n.s. **56**: 18 (1918).

var. **alpina** (Kunth ex Baker) Hara in Journ. Jap. Bot. **38**: 72 (1963); Spring Fl. Sikkim Himal. f. 96 (1963).

Smilacina alpina Royle, Ill. Bot. Himal. 380 (1839), nom. nud.

Clintonia alpina (Royle) Kunth, Enum. Pl. **5**: 159 (1850), nom. nud.–Baker in Journ. Linn. Soc. **14**: 585 (1875), cum descr.–Fl. Brit. Ind. **6**: 361 (1892)–Hand.-Mzt., Symb. Sin. **7**: 1205 (1936)–Kitamura, Faun. & Fl. Nepal Himal. 92 (1955)–Kanai in Journ. Fac. Sci. Univ. Tokyo Bot. **8**: 318, f. 9 (1963).

C. udensis subsp. *alpina* (Kunth) Kitamura in Act. Phytotax. Geobot. **22**: 68 (1966).

Bakkim–Jongri, 3500 m (May 19, 1960, no. 367, fl.); Nayathang–Phalut, 3100–3500 m (Jun. 2, 1960, fl.); Walunchung Gola, 3800 m (Nov. 11, 1963).

Distr. Himalaya (Garhwal to Bhutan), and W. China.

The relationship between *C. udensis* and var. *alpina* was discussed in Advanc. Front. Pl. Sci. **8**: 25 (1964).

Disporum cantoniense (Lour.) Merrill in Philip. Journ. Sci. **15**: 229 (1919); in Trans. Amer. Philos. Soc. n.s. **24** (2): 109 (1935)–Spring Fl. Sikkim Himal. f. 163 (1963).

Fritillaria cantoniensis Loureiro, Fl. Cochinch. 206 (1790).

Uvularia chinensis Ker-Gawl. in Bot. Mag. t. 916 (1806).

Disporum pullum Salisbury in Trans. Hort. Soc. Lond. **1**: 331 (1812)–Fl. Brit. Ind. **6**: 360 (1892).

var. **parviflorum** (Wall.) Hara, comb. nov.

Uvularia parviflora Wallich in Asiat. Research. **13**: 378 (1820).

Uvularia umbellata Wallich in Asiat. Research. **13**: 379 (1820); Pl. Asia. Rar. **3**: 43, t. 269 (1832).

Disporum Pitsutum D. Don, Prodr. Fl. Nepal. 50 (1825).

D. pullum var. *parviflorum* (Wall.) Baker in Journ. Linn. Soc. **14**: 589 (1875).

Takdah, 1700 m (Apr. 19, 1960, no. 1993, bud); Batasi, 2000 m (May 2, 1960, bud); Chia Bhanjang–Dentam, 3100–1400 m (May 11, 1960, fl.); Yoksam–Bakkim, 1700–2500 m (May 18, 1960, fl.); Kakani, 2100–2200 m (Sep. 24, 1963, fr.); Garhi Danra, 2200 m (Nov. 3, 1963, fr.); Iladanda–Selap, 1800–2600 m (Nov. 9, 1963, fr.); Lelep, 2500 m (Nov. 9, 1963); Baroya Khimty, 2500 m (Nov. 10, 1963, fr.); Illam–Ranga Pani, 1200–700 m (Dec. 8, 1963, fr.); Ranga Pani–Ghorwa, 700–300 m (Dec. 9, 1963, fr.); Ghorwa–Sanichare, 300–200 m (Dec. 10, 1963, fr.).

Distr. sp. Himalaya (Garhwal to NEFA), Khasia, Manipur, N. Burma, N. Thai, Indo-China, Malaysia, China, and Formosa.

The typical Chinese plant which has long been cultivated in Japan has short (5–10 mm long) and slightly scabrous pedicels, flowers tinged with brownish purple, and tepals distinctly (2–3 mm long) saccate at the base. Our Himalayan plants have longer (up to 20 mm) and minutely papillose pedicels, yellowish green flowers, and tepals very shortly (1 mm) saccate at the base and papillose on the margin. *Uvularia parviflora* seems to have been described based on a plant with young immature flowers. See also a note by Kurosawa on page 666.

Fritillaria cirrhosa D. Don, Prodr. Fl. Nepal. 51 (1825)–Fl. Brit. Ind. **6**: 353 (1892)–Turrill in Bot. Mag. n.s. t. 255 (1955)–Spring Fl. Sikkim Himal. f. 88 (1963).

Sandakphu, 3600 m (May 7, 1960, fl.); Phalut, 3500 m (May 9 & Jun 4, 1960, no. 648, fl.); north of Jongri, 4000–4500 m (May 25, 1960, fl.); Jongri–Gamothang, 4200–3600 m (May 26, 1960, no. 509, fl.); Migothang, 4200 m (May 31, 1960, fl.); Migothang–Nayathang, 3900–3300 m (Jun. 1, 1960, no. 722, fl.).

Distr. sp. Himalaya (Kashmir to Sikkim), S. Tibet, and W. China.

Hemerocallis fulva L., Sp. Pl. ed. 2, **1**: 462 (1762)–Fl. Brit. Ind. **6**: 326 (1892).

var. **Kwanso** Regel in Gartenfl. **15**: 66, t. 500 (1866).

H. disticha Donn var. *Kwanso* (Regel) Nakai in Bot. Mag. Tokyo **38**: [179] (1924); **46**: 115 (1932).

Darjeeling (1963), cult. in Tokyo (Jul. 7, 1964, fl.).

Distr. China, widely cultivated and sometimes escaped in Himalaya and Japan.

Lilium nepalense D. Don in Mem. Wern. Soc. **3**: 412 (1821)–Fl. Brit. Ind. **6**: 350 (1892)–Grove et Cotton in Suppl. Elwes' Monogr. Lilium 59, t. 17 (1937)–Woodcock et Stearn, Lilies of World 288, f. 84 (1950).

Tinjuray, 2900 m (Oct. 27, 1963, fr.); Lam Pokhari, 2900 m (Oct. 28, 1963, fr.).

Distr. Himalaya (Kumaon to NEFA).

Lloydia Delavayi Franchet in Journ. de Bot. **12**: 193 & 195 (1898)–Spring Fl. Sikkim Himal. f. 16 (1963).

North of Jongri, 4000–4500 m (May 25, 1960, no. 482, fl.); Gamothang–Migothang, 3750–3900 m (May 30, 1960, fl.); Migothang, 3900 m (May 31, 1960, fl.).

Distr. E. Himalaya (Nepal, Sikkim), S. E. Tibet, and W. China.

Critical notes on the *Lloydia serotina* group of Himalayas are given on page 655.

Lloydia Mairei Léveillé in Bull. Géogr. Bot. **25**: 38 (1915)–Hand.-Mzt., Symb. Sin. **7**: 1202 (1936).

Migothang–Nayathang, 3300–3900 m (Jun. 1, 1960, fl.).

Distr. E. Himalaya (Sikkim), and W. China.

Lloydia serotina (L.) Reichenbach, Fl. Germ. Excurs. **1**: 102 (1830)–Fl. Brit. Ind. **6**: 354 (1892), p.p.–Hultén, Fl. Alaska **3**: 456 (1943).

L. himalensis Royle, Ill. Bot. Himal. t. 93, f. 2 (1839) & 388 (1840), e typo.

Phalut, 3500 m (Jun. 5, 1960, no. 650, fl.).

Distr. Europe, Caucasus, C. Asia, Siberia, Himalaya, Tibet, N. China, Japan (south to central Honshu), and N. America.

Notholirion macrophyllum (D. Don) Boissier, Fl. Orient. **5**: 190 (1882)–Bot. Mag. t. 9355 (1934)–Suppl. Elwes' Monogr. Lilium 117, t. 27 (1940)–Woodcock et Stearn, Lilies of World 379, f. 125, 136 (1950).

Fritillaria macrophylla D. Don, Prodr. Fl. Nepal. 51 (1825.).

Lilium roseum Wall. ex Fl. Brit. Ind. **6**: 352 (1892), p.p.

Zongi–Walunchung Gola, 2800–3800 m (Nov. 10, 1963, fr.); Siling Tzokupa, 3000 m (Nov. 21, 1963, fr.; cult. in Tokyo, May 1964, fl.).

Distr. E. Himalaya (Nepal to Bhutan), and S. Tibet.

Ophiopogon Clarkei Hook. f., Fl. Brit. Ind. **6**: 268 (1892)–Lacaita in Journ. Linn. Soc. **43**: 482 (1916).

Batasi–Palmajua, 2300–2600 m (May 3, 1960, fr.); Senchal, 2400 m (Dec. 27, 1963; cult. in Tokyo, Jul. 8, 1965, fl.).

Distr. E. Himalaya (Nepal, Sikkim), Manipur, and W. China (Yunnan).

The species closely resembles *O. intermedius*, but differs from the latter in having long creeping stolons, and loose racemes with a few larger open-campanulate flowers. The chromosome number is $2n=36$.

Ophiopogon intermedius D. Don, Prodr. Fl. Nepal. 48 (1825)–Royle, Ill. Bot. Himal. 384, t. 96 (1839)–Fl. Brit. Ind. **6**: 269 (1892).

O. indicus Wight, Icon. **6**: t. 2050 (1853).

Mondo intermedium (D. Don) Bailey, Gent. Herb. **2**: 25, f. 12 (1929).

Yoksam–Preig Chu, 1700–2200 m (May 18, 1960, no. 419, fl.); Garibans–Tonglu, 2800–3000 m (Jun. 7, 1960, no. 692, fl.); Darjeeling, 2150 m (Jun. 18, 1960, fl.); Bilbatay Bhanjang, 2200 m (Oct. 25, 1963, fr.); Minchin Dhap–Mul Pokhari, 2900–2500 m (Oct. 29, 1963, fr.); Helok, 1500 m (Nov. 9, 1963, fr.); Batasay–Bhuspate Danra, 2400–2800 m (Dec. 1, 1963, fr.).

Distr. Himalaya (Kashmir to NEFA), Khasia, Manipur, N. Thai, and W. China.

The species was described from Nepal based on Wallich's specimen. In the Wallich Herbarium at Kew, there is a specimen (No. 5139 A) collected by Wallich in Nepal in 1821, and it can be regarded as the type of *O. intermedius* D. Don, as suggested by Bailey, because no other specimen considered as authentic is found at Kew or at the British Museum. This specimen, however, does not agree with D. Don's original diagnosis of 1825 in some respects, especially in its leaves which are described as 'Folia . . . vix lineam lata'. The leaves of the Wallich's specimen are 4–7 mm wide, and our collections cited above agree well with Wallich's one. *O. Wallichianus* (Kunth) Hook. f. based on Wallich No. 5139 B from Silhet may also be conspecific with *O. intermedius.*

O. planiscapus Nakai of Japan is closely allied to *O. intermedius*, but has creeping stolons, smaller flowers, and shorter anthers.

Ophiopogon parviflorus (Hook. f.) Hara in Journ. Jap. Bot. **40**: 21 (1965).

O. intermedius D. Don var. 3. *parviflora* Hook. f., Fl. Brit. Ind. **6**: 269 (1892).

Darjeeling, 2150 m (Apr. 2, 1960, fr.; Mar. 22, 1963; cult. in Tokyo, Jul. 24, 1965, fl.); Murhay, 2000 m (Oct. 23, 1963, fr.); Taplejung–Garhi Danra, 1900–2200 m (Nov. 3, 1963, fr.); Iladanda–Helok, 1800–1500 m (Nov. 13, 1963, fr.); Yektin–Batasay, 1400–2400 m (Nov. 30, 1963, fr.).

Distr. E. Himalaya (Nepal, Sikkim), and Khasia.

In the autumnal stage, this species closely resembles a narrow-leaved form of *O. intermedius*, but is clearly distinguished from the latter in the characters of flowers. The scapes are very slender bearing only 2–4 flowers, the corollae small and infundibuliform, 5–6 mm long with oblong lobes 3–3.5 mm long, and the anthers much shorter and ca. 1.5 mm long. It is hexaploid with 2n=54 chromosomes, while *O. intermedius* is tetraploid.

Paris polyphylla Smith in Rees, Cyclop. **26**: no. 2 (1819)–Hook. f., Ill. Himal. Pl. t. 24 (1855)–Franchet in Mém. Soc. Philom. Paris 287 (1888)–Fl. Brit. Ind. **6**: 362 (1892)–Spring Fl. Sikkim Himal. f. 160 (1963). [Pl. 3 b]

Senchal, 2350 m (Apr. 3, 1960, fl.); Ghum, 2300 m (Apr. 4, 1960, fl.); Batasi, 2000 m (May 2, 1960, fl.); Ramam, 2400 m (May 8, 1960, fl.); Yoksam, 1700 m (May 17, 1960, fl.); Penlong La, 2100 m (Jun. 16, 1960; Mar. 18, 1963, fl.); Damthang–Rabong La, 2200 m (Mar. 28, 1963, fl.); Murhay, 2000 m (Oct. 23, 1963, fr.); Chitray, 2100 m (Oct. 24, 1963, fr.); Bilbatay Bhanjang–Tinjuray, 2200–2900 m (Oct. 24, 26 & 27, 1963, fr.); Gatribas–Tonglu, 2900 m (Sep. 17, 1964, fr.).

var. **brachystemon** Franchet in Journ. de Bot. **12**: 191 (1898)–Hand.-Mzt., Symb. Sin. **7**: 1216 (1936).

? *P. marmorata* Stearn in Bull. Brit. Mus. **2**: 79, f. 11, t. 8 (1956).

Rimbick–Ramam, 1900–2400 m (May 7, 1960, fl.); Bakkim–Jongri, 2500–300 m (May 19, 1960, fl.).

var. **appendiculata** Hara, var. nov.

A typo differt staminibus pistillo multo longioribus, filamentis 5–6 mm longis, antheris 4–6 mm longis, connectivo elongato 3.5–5 mm longo et foliis basi cuneatis.

Bakkim–Jongri, 2500–4000 m (May 19, 1960, no. 366—Typus in TI); Migothang–Nayathang, 3900–3300 m (Jun. 1, 1960).

Distr. sp. Himalaya (Kashmir to NEFA), S. Tibet, Khasia, Manipur, N. Thai, W. & C. China, and Formosa.

The species has been known to be extremely polymorphic, and our collections show a very wide range of variations. *P. marmorata* Stearn (1956) seems also to fall within the variations of the species.

Although variable in size and number of leaves and floral parts, the specimens cited above under typical *P. polyphylla* have distinct petioles, and anthers 4–8 mm long with a short producing part of the connective (0.3–1.5 mm long).

The specimens referred to var. *brachystemon* are generally smaller in all parts. The leaves are narrower, attenuate at the base to a very short petiole, often dark green and whitish along veins above, and dark purplish beneath. Some specimens closely resemble *P. marmorata*, but the anthers are oblong and 3 mm long, while some others have longer anthers, longer sepals and petals, and more distinct petioles, showing intermediate characters between *P. marmorata* and *P. polyphylla*.

Var. *appendiculata* is a perplexing form. Its connectives are distinctly elongate and are nearly as long as the anther, but in other respects, it is very similar to *P. polyphylla*. In the character of stamens, it comes very near to *P. Henryi* Diels, and

P. thibetica Franch., and the relationships between them should be reinvestigated based on more ample material. Our specimen collected between Chia Bhanjang and Phalut, 3100–3500 m (Jun. 2, 1960, no. 768) agrees with var. *appendiculata* in stamens, but lacks filiform petals, and in this respect corresponds with *P. thibetica* Franch. var. *apetala* Hand.-Mzt.

Regarding the chromosomes, both diploid ($2n=10+0\text{-}2B$) and tetraploid ($2n=20+0\text{-}2B$) have been known. The diploid race has recently been reported from Simla (Malik 1961) and N. Thai (Larsen 1963), and *P. formosana* from Formosa which is considered as conspecific with *P. polyphylla* is also diploid (Gotoh & Kikkawa 1937). Typical *P. polyphylla* which was sent from the Royal Botanic Garden of Edinburgh by courtesy of Mr. Burtt is diploid too.

While, the teraploid race has hitherto been reported only by Malik (1961) from Manali and also from Simla. It is noteworthy that our two collections are tetraploid, one from Darjeeling, and the other from Bhandukay Bhanjang which is similar to var. *brachystemon* in outer morphological characters. (See Kurosawa on page 666).

Peliosanthes Griffithii Baker in Journ. Linn. Soc. **17**: 506 (1879)–Fl. Brit. Ind. **6**: 266 (1892).

Takdah–Rayang, 1600–250 m (Apr. 20, 1960, no. 2180, fr.); Illam–Ranga Pani, 1200–400 m (Dec. 8, 1963, fr.); Ranga Pani–Ghorwa, 700–300 m (Dec. 9, 1963); Ghorwa–Sanichare, 300–200 m (Dec. 10, 1963, fr.).

Distr. E. Himalaya (Nepal, Sikkim).

Peliosanthes macrophylla Wallich ex Baker, l.c. 505 (1879)–Fl. Brit. Ind. **6**: 266 (1892).

Illam–Ranga Pani, 1200–400 m (Dec. 8, 1963, fr.); Ranga Pani–Ghorwa, 700–300 m (Dec. 9, 1963, fl.).

Distr. E. Himalaya (Nepal, Sikkim), Mishmi Hills, and W. China.

Polygonatum brevistylum Baker in Journ. Linn. Soc. **14**: 556 (1875), e typo–Fl. Brit. Ind. **6**: 319 (1892).

Above Bakkim, 2500–3000 m (May 19, 1960, bud).

Distr. E. Himalaya (Sikkim).

Polygonatum Cathcartii Baker in Journ. Linn. Soc. **14**: 559 (1875), e typo–Fl. Brit. Ind. **6**: 320 (1892).

Senchal–Tiger Hill, 2400–2500 m (Jun. 23, 1960, fl.).

Distr. E. Himalaya (Sikkim), and Naga Hills.

Polygonatum cirrhifolium (Wall.) Royle, Ill. Bot. Himal. 380 (1839)–Fl. Brit. Ind. **6**: 322 (1892).

Convallaria cirrhifolia Wallich in Asiat. Research. **13**: 382, fig. (1820).

Dentam–Pamianchi, 1700 m (May 12, 1960, fl.); Jongri–Gamothang, 3600–4200 m (May 26, 1960, no. 560, bud); Gamothang, 3800 m (May 29, 1960, no. 553).

Distr. Himalaya (Simla to Bhutan), Manipur, Tibet, and W. China.

Polygonatum Hookeri Baker in Journ. Linn. Soc. **14**: 558 (1875)–Hook., Icon. Pl. t. 2218 (1892)–Fl. Brit. Ind. **6**: 320 (1892).

North of Jongri 4000–4500 m (May 25, 1960, fl.); Jongri, 4200 m (May 22, 1960, fl.).

Distr. Himalaya (Garhwal to Sikkim), and W. China.

Polygonatum oppositifolium (Wall.) Royle, Ill. Bot. Himal. 380 (1839)-Fl. Brit. Ind. **6**: 320 (1892).

Convallaria oppositifolia Wallich in Asiat. Research. **13**: 380, fig. (1820).

Batasi, 2000 m (May 2, 1960, fl.); Kurseong, 1500 m (Apr. 12, 1960, fl.); above Dentam, 1450 m (May 11, 1960, fl.); Tuwa-Taplethok, 1800-1300 m (Nov. 5, 1963, fr.); Mai Majuwa-Dhara Pani, 1900-1500 m (Dec. 3, 1963, fr.).

Distr. Himalaya (Nepal, Sikkim), Khasia, and Manipur.

Polygonatum punctatum Royle [Ill. Bot. Himal. 380 (1839), nom. nud.] ex Kunth, Enum. Pl. **5**: 142 (1850)-Fl. Brit. Ind. **6**: 321 (1892).

Batasi, 2000 m (May 2, 1960, fl., fr.); Palmajua, 2200 m (May 4, 1960); Palmajua-Rimbick, 2300-2200 m (May 5, 1960, fl.); Ramam, 2400 m (May 8, 1960, fl.); Hati Sar-Minchin Dhap, 2700-2900 m (Oct. 28, 1963, fr.); Baroya Khimty, 2500 m (Nov. 11, 1963, fr.); Bhandukay Bhanjang, 3100 m (Dec. 3, 1963, fr.); Tendong Peak, 2500 (Mar. 26, 1963, fr.).

Distr. Himalaya (Nepal to NEFA), and Manipur.

Polygonatum singalilense Hara in Journ. Jap. Bot. **40**: 102 (1965). [Fig. 26]

Migothang-Nayathang, 3700-3300 m (Jun. 1, 1960, no. 714, fl.—Typus).

Distr. Endemic to the Singalila Range.

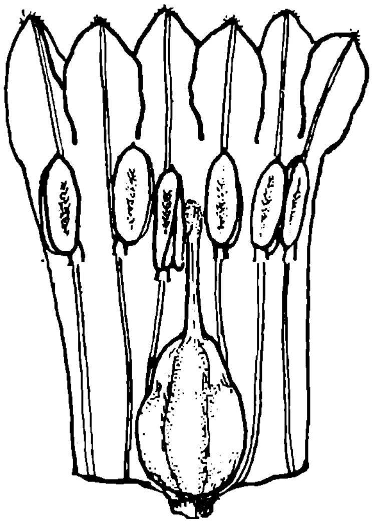

Fig. 26. *Polygonatum singalilense* Hara. Flower, with expanded corolla, ×5.

Polygonatum verticillatum (L.) Allioni, Fl. Pedem. **1**: 131 (1785)-Fl. Brit. Ind. **6**: 321 (1892)-Spring Fl. Sikkim Himal. f. 98 (1963).

Convallaria verticillata L., Sp. Pl. ed. 1, **1**: 315 (1753).

Chia Bhanjang-Dentam, 3100-1450 m (May 11, 1960, fl.); Gamothang, 3750 m (May 26, 1960, no. 535, bud); Chia Bhanjang-Phalut, 3100-3500 m (Jun. 2, 1960, no. 622 & 770, fl.); Phalut, 3000-3500 m (Jun. 5, 1960, no. 662, fl.); Sandakphu-Garibans, 3600-2800 m (Jun. 7, 1960, fl.); Hati Sar-Minchin Dhap, 2700-2900 m (Oct. 28, 1963); Sandakphu, 3600 m (Sep. 16, 1964, fr.).

Distr. Europe, Asia Minor, C. Asia, Himalaya (Kashmir to Sikkim), Tibet, Manipur, and W. China.

Smilacina fusca Wallich, Pl. Asia. Rar. **3**: 37, t. 257 (1832)-Fl. Brit. Ind. **6**: 323 (1892)-Spring Fl. Sikkim Himal. f. 161 (1963)-Hara et Kurosawa in Journ.

Jap. Bot. **38**: 72, f. 1 (1963). [Pl. 8 d, e]

S. bootanensis Griffith, Icon. Pl. Asia. t. 279 (1847).

Medora divaricata Kunth, Enum. Pl. **5**: 156 (1850).

Tovaria finitima W. W. Smith in Not. Bot. Gard. Edinb. **12**: 225 (1920).

Smilacina finitima (W. W. Sm.) Wang et Tang in Bull. Fan Mem. Inst. **7**: 288 (1937).

Darjeeling, 2100 m (Apr. 14, 1960, fl.; Jun. 18, 1960, fr.); Kurseong, 1500 m (Apr. 12, 1960, fl.); Senchal, 2300 m (Apr. 17, 1960, no. 1963, fl.); Batasi, 2200 m (May 2, 1960, fl.); Batasi–Palmajua, 2300–2600 m (May 3, 1960, fl.); Palmajua–Rimbick, 2200–1500 m (May 5, 1960, fl.); Bakkim, 2000 m (May 19, 1960, fl.); Bilbatay Bhanjang, 2200 m (Oct. 25, 1963, fr.); Baroya Khimty, 2500 m (Nov. 11, 1963, fr.); Batasay–Bhuspate Danra, 2400–2800 m (Dec. 1, 1963, fr.).

f. **papillosa** Hara, f. nov.

Caules superne, petioli et rachides inflorescentiae minute papilloso-pilosi.

Simkuna Bazar, near Ghum, 2200 m (Apr. 17, 1960, no. 1963, fl.—Typus in TI); Birwa–Yektin, 2800–1600 m (Nov. 28, 1963, fr.); Bilbatay Bhanjang, 2200 m (Oct. 25, 1963, fr.).

var. **pilosa** Hara, var. nov.

Differt a typo caulibus in parte superiore petiolisque rigide pilosis, foliis margine ciliatis, rachidibus inflorescentiae non flexuosis, et pedicellis fructiferis filiformibus 8–20 mm longis.

E. Nepal: Tinjuray, ca. 2800 m (Oct. 27, 1963, fr.—Typus in TI).

Distr. sp. E. Himalaya (Nepal to NEFA), Khasia, Manipur, N. Burma, and W. China (Yunnan).

The species is unique in the genus in having very short stamens with subglobular carnose filament, small oval outer tepals, and drooping zigzag inflorescences, and it merits recognition as a separate section, i.e. Sect. Medora (Kunth) Hara in Advanc. Front. Pl. Sci. **8**: 28 (1964). It is, however, variable in the hairiness and the shape of leaves. The typical race is entirely glabrous, and has thinner somewhat rugose ovate leaves cordate at the base, and longer petioles. But another glabrous race which has thicker smooth oblong leaves generally roundish at the base, and shorter petioles occur. As intermediate forms are often found, these two races are not clearly distinguished. The species has hitherto been known as octoploid ($2n=72$) which is rare in the genus (see Kurosawa on page 668). A form with minutely papillose stems, petioles, and inflorescences is here described.

On the other hand, the specimens collected at the Tinjuray Pass have pubescent stems with rigid hairs, leaves ciliate on the margin, not flexuose inflorescences, with pilose rachis, and filiform fruiting pedicels 8–20 mm long. In the hairiness, they somewhat resemble *S. purpurea*. Although the differences between the specimens and the typical form are remarkable, I tentatively treat them as a new variety of *S. fusca*.

Smilacina oleracea (Baker) Hook. f. et Thoms. in Fl. Brit. Ind. **6**: 323 (1892)–Hand.-Mzt., Symb. Sin. **7**: 1206 (1936)–Spring Fl. Sikkim Himal. f. 93 (1963).

Tovaria oleracea Baker in Journ. Linn. Soc. **14**: 569 (1875); in Bot. Mag. t. 6313 (1877).

Smilacina mientienensis Wang et Tang in Bull. Fan Mem. Inst. **7**: 287 (1937), e typo.

Batasi–Palmajua, 2300–2600 m (May 3, 1960, fl.); Preig Chu–Jongri, 2500–4000 m (May 19, 1960, no. 396, fl.); Chia Bhanjang–Phalut, 3100–3500 m (Jun. 2, 1960, no. 628, fl. purplish); Garibans–Tonglu, 2800–3000 m (Jun. 7, 1960, no. 695, fl.).

Distr. E. Himalaya (Nepal to Bhutan), S. E. Tibet, N. Burma, and W. China (Yunnan).

Smilacina purpurea Wallich, Pl. Asia. Rar. **2**: 38, t. 144 (1831)–Hand.-Mzt., Symb. Sin. **7**: 1206 (1936).

Jocaste purpurea (Wall.) Kunth, Enum. Pl. **5**: 154 (1850).

Phalut, 3500 m (Jun. 5, 1960); Sandakphu, 3600 m (Sep. 16, 1964, fr.).

f. **oligophylla** (Baker) Hara, comb. nov.

Tovaria oligophylla Baker in Journ. Linn. Soc. **14**: 565 (1875).

Smilacina oligophylla (Baker) Hook. f. in Fl. Brit. Ind. **6**: 323 (1892).

Gamothang, 3800 m (May 29, 1960, fl.); Migothang, 3900 m (May 31, 1960, fl.); Migothang–Nayathang, 3900–3300 m (Jun. 1, 1960, fl.); Chia Bhanjang–Phalut, 3100–3500 m (Jun. 2, 1960, no. 621, fl.).

Distr. Himalaya (Kashmir to Sikkim), S. Tibet, and W. China.

The species has 5–7 leaves which are hairy beneath and distinctly ciliate on the margin, branched inflorescence with villose rachis, roundish tepals dark purple at least along margin, subulate filaments nearly a half as long as tepals, and short style with distinctly three-lobed stigma.

T. oligophylla Baker is a smaller plant with fewer (4–5) leaves and simple loose inflorescences, but it seems to be only an alpine form of *S. purpurea*.

The type of *Tovaria pallida* Baker (Wallich no. 4201 B, *S. purpurea* var. *albida* from Kumaon at Kew) closely resembles *S. purpurea*, but has simple dense inflorescences with many white flowers, and longer (ca. 1 mm) style with only slightly trifid stigma. Some specimens from Garhwal or Yunnan have dark purple flowers, but have simple recemes and longer style ca. 1.2 mm long with slightly trifid stigma. Whereas some specimens with white flowers have looser racemes, or short style with three-lobed stigma. So I wish to treat a white-flowered race with simple dense racemes from Western Himalaya as a variety of *S. purpurea*. Collett's description of *S. pallida* that the berry is blue-black needs to be reconfirmed.

The genus *Smilax* is best differentiated in the montane region of Eastern Himalaya and adjacent southeastern Asia especially at an altitude between 1,000 and 2,500 m above sea level. Of 21 species of *Smilax* that I recognized as valid from Eastern Himalaya (T. Koyama, 1961), 12 species are included in this collection. *Smilax lanceifolia* and *S. megacarpa* are two common species among those plants which have not been collected during the Expeditions.

Smilax aspera L., Sp. Pl. ed. 1, 1028 (1753)–A. DC., Monogr. Phaner. **1**: 163 (1878), incl. var. *maculata*–Fl. Brit. Ind. **6**: 306 (1892)–T. Koyama in Adv. Front. Pl. Sci. **4**: 61 (1961).

S. maculata Roxb., Fl. Ind. ed. 2, **3**: 796 (1832).

S. fulgens Wall. [Cat. no. 5122 (1830), nom. nud.] and *S. nilagirensis* Steud. ex

Hook. f., Fl. Brit. Ind. **6**: 306 (1892), pro. syn.

Taplejung, 1700 m (Nov. 2, 1963, fl.); Taplejung–Garhi Dandra, 2000–2200 m (Nov. 3, 1963, fl.); Taplethok–Helok, 1300–1500 m (Nov. 6, 1963, fl.); above Lelep, 2600 m (Nov. 9, 1963, fl.); Iladanda–Helok, 1800–1500 m (Nov. 13, 1963, fr.).

Distr. Widely distributed from the Mediterranean region throughout southern central Asia eastwards to India and southeastwards to Ceylon.

Smilax bracteata Presl, Rel. Haenk. **1**: 131 (1827).

subsp. **verruculosa** (Merrill) T. Koyama, stat. nov.

S. aspericaulis Wall. [Cat. no. 5129 (1830), nom. nud.] ex A. DC., Monogr. Phaner. **1**: 195 (1878)–Fl. Brit. Ind. **6**: 306 (1892).

S. verruculosa Merrill in Philip. Journ. Sci. **5**: 173 (1910).

Birch Hill, Darjeeling, 2000 m (Apr. 7, 1960).

Distr. E. Himalaya, Burma, Indo-China, Malaysia, and Formosa.

For detailed synonymy and taxonomic discussion see T. Koyama (in Quart. Journ. Taiwan Mus. **10**: 18, 1957, and in Adv. Front. Pl. Sci. **4**: 47, 1961).

Smilax ferox Wall. [Cat. no. 5119 (1830), nom. nud.] ex Kunth, Enum. Pl. **5**: 251 (1850)–A. DC., Monogr. Phaner. **1**: 103 (1878)–Fl. Brit. Ind. **6**: 307 (1892)–T. Koyama, l.c. 63, f. 4 (1961).

St. Paul Hill, 2250 m (Apr. 7 & 10, 1960); Senchal, 2400 m (Apr. 16, 1960); Batasi, 2000 m (May 2, 1960); Palmajua, 2300 m (May 4, 1960); Palmajua–Rimbick 2200–2300 m (May 5, 1960); Murhay–Bilbatay Bhanjang, 2000–2200 m (Oct. 24, 1963); Sinduwa, Dhankuta District, 1100 m (Oct. 24, 1963); Minchin Dhap–Mul Pokhari, 2800–2400 m (Oct. 29, 1963); Batasay, 2400 m (Nov. 30, 1963).

Distr. Nepal, Sikkim, Assam, N. Burma, northern Annam, and China (Yunnan, Szechuan, Kweichow, Kwansi).

Smilax glaucophylla Klotzsch in Reise Prinz. Wald. Bot. 45, t. 91 (1862)–T. Koyama, l.c. 67, f. 6 (1961).

S. elegans Wall. [Cat. no. 5117 B (1830), nom. nud.] ex A. DC., Monogr. Phaner. **1**: 107 (1878), incl. var. *major* A. DC.

S. parvifolia Wall. [Cat. no. 5118 B (1830), nom. nud.] ex Hook. f., Fl. Brit. Ind. **6**: 304 (1892).

S. longibracteolata Hook. f., Fl. Brit. Ind. **6**: 305 (1892).

Rimbick–Ramam, 1900–2400 m (May 7, 1960); Ramam–Phalut, 2400–3500 m (May 9, 1960); Iladanda–Selap, 2500 m (Nov. 9, 1963); ditto, 2800 m (Nov. 12, 1963); Baroya Khimty–Thakma Khola, 3100 m (Nov. 16, 1963); Bhandukay–Ghatte, ca. 2000 m (Nov. 16, 1963); Birwa–Yektin, 2200 m (Nov. 28, 1963); Halhale, 2800 m (Dec. 1, 1963); Dhankuta–Murhay, 1500–2000 m (Dec. 23, 1963).

Distr. Himalaya, Tibet and southwestern China (Szechuan and Yunnan, northeastwards to Hupeh).

This species occurs commonly and abundantly in Eastern Himalaya, and is extremely variable in both vegetative and floral characters. The leaves, which are mostly ovate-elliptic to ovate-oblong with a round base, may sometimes become broader and ovate with a more or less cordate base. The umbels, normally bearing 5 to 8 flowers on a relatively short, straightish peduncle, frequently tend to have only a few (as many as 3) flowers on an elongated, slender peduncle, which is pendant at maturity. The typical phase of *Smilax menispermoidea* in southwestern

China and Indo-China differs from *S. glaucophylla* primarily by its broadly ovate leaves with a distinctly cordate base, and the few-flowered umbels on slender, pendant peduncle. The Eastern Himalayan population of *S. menispermoidea*, however, has definitely narrower leaves with a hardly cordate base. These two distinct species are thus greatly resembling one another in Eastern Himalaya causing some confusion. As a matter of fact, *S. elegans* Wallich has been differently interpreted by DeCandolle and J. D. Hooker. Nevertheless, the leaves in *S. glaucophylla* are invariably conspicuously glaucous beneath, and are on stiff, terete and more or less shiny branchlets, whereas in *S. menispermoidea* the leaves with the pale lower surface are on striate or angular branchlets of climbing nature.

Smilax menispermoidea A. DC., Monogr. Phaner. **1**: 108 (1878)–T. Koyama, l.c. 70, f. 7 (1961).

S. elegans Wall. [Cat. no. 5117 A (1830), nom. nud.] ex Hook. f., Fl. Brit. Ind. **6**: 305 (1892); non Wall. ex A. DC. (1878).

Garibans–Tonglu, 2800 m (Jun. 7, 1960, fl.).

Distr. Himalaya, southwestern China, Indo-China, and Malaysia. For a discussion see the preceding species.

Smilax minutiflora A. DC., Monogr. Phaner. **1**: 109 (1878)–Fl Brit. Ind. **6**: 305 (1892)–T. Koyama, l.c. 72, f. 8 (1961).

Senchal, 2300 & 2400 m (Apr. 6, 1960 & Dec. 27, 1963, fr. black); Batasi–Palmajua, 2300–2600 m (May 3, 1960); Chia Bhanjang–Dentam, 2500–3100 m (May 11, 1960); Bakkim–Jongri, 2500–4000 m (May 19, 1960); Sandakphu–Garibans, 2800–3000 m (Jun. 7, 1960); Senchal–Tiger Hill, 2400–2500 m (Jun. 23, 1960); Tendong Peak, 2750 m (May 26, 1963); Tonglu–Sandakphu, 3000–3600 m (Sep. 16, 1964); Minchin Dhap–Mul Pokhari, 2900–2500 m (Oct. 26, 1963); Thakma Khola–Diorali Bhanjang, 3300–3500 m (Nov. 17, 1963).

Distr. Endemic in E. Himalaya.

This species closely resembles *S. vaginata* of Western Himalaya and China. In addition to complete geographical separation, *S. minutiflora* differs from *S. vaginata* in the leaf blades, which are lance-elliptic with a cuneate base vs. rounded-ovate with a cordate base.

Smilax ocreata A. DC., Monogr. Phaner. **1**: 193 (1878)–T. Koyama, l.c. 57, f. 3 D, E (1961).

S. prolifera Wall., Cat. no. 5124 BD (1830), nom. nud., p.p.

S. Roxburghiana Wall. [Cat. no. 5115 (1830)] ex Hook. f., Fl. Brit. Ind. **6**: 311 (1892), p.p., excl. syn. *S. orthoptera*.

Gangtok Orchid Sanctuary, 1500 m (May 18, 1963); Khebang–Bharomdin, 1700–1000 m (Nov. 24, 1963); Tharpu, near Chyangthaphu, 1200 m (Nov. 26, 1963)

Distr. Endemic in eastern India including Kumaon, Sikkim, Assam, East Bengal, Bihar and Almora District.

J. D. Hooker failed to separate *S. ocreata* from *S. orthoptera*. *S. ocreata* clearly differs from the latter by the auricles of leaf sheaths as illustrated by the author (T. Koyama, l.c. 1961). In *S. ocreata*, the auricles are ovate with a rounded base completely clasping the branchlet, and are the broadest immediately above the base, whereas in *S. orthoptera* they are more or less oblanceolate-obovate with a cuneate base never clasping the branchlet, and are the broadest below the tip. This particular shape of auricles in association with other characters suggests very close affinity between *S. ocreata* and *S. perfoliata.* Valid difference between these two plants consists only in the number of umbels on a single raceme, which is 1 to 3 vs. 7 to 15. With a slight hesitstion, I keep *S. ocreata* as specifically distinct from *S. perfoliata* until that time, when the numbers of umbels are proved to be continuous.

Smilax orthoptera A. DC., Monogr. Phaner. **1**: 193 (1878)-T. Koyama, l.c. 56, f. 3 *A-C* (1961).

S. Roxburghiana Wall. ex Hook. f., Fl. Brit. Ind. **6**: 311 (1892), p.p., concerning the synonym, *S. orthoptera.*

Peshok, 900 m (Apr. 27, 1960).

Distr. Sikkim and Assam.

Smilax ovalifolia Roxb., Fl. Ind. ed. 2, **3**: 794 (1832)-Wight, Icon. t. 809 (1851)-T. Koyama, l.c. 48, f. 1 (1961).

S. macrophylla Roxb. [Hort. Beng. 72 (1814), nom. nud.] Fl. Ind. ed. 2, **3**: 793 (1832)-A. DC., Monogr. Phaner. **1**: 193 (1878)-Fl. Brit. Ind. **6**: 310 (1892); non Willd. (1805).

S. prolifera Wall., Cat. no. 5124 C, D (1830), nom. nud., p.p.

Illam-Ranga Pani, 1200-700 m (Dec. 8, 1963); Sanichare, 200 m (Dec. 10, 1963).

Distr. India, N. Burma, and northern Indo-China.

Smilax perfoliata Loureiro, Fl. Cochinch. 622 (1790)-T. Koyama, l.c. 59 (1961).

S. prolifera Wall. [Cat. no. 5124, A, B, D p.p., E, C, et H (1830), nom. nud.] ex Roxb., Fl. Ind. ed. 2, **3**: 795 (1832)-Fl. Brit. Ind. **6**: 312 (1892).

Peshok, 900 m (Apr. 27, 1960).

Distr. Nepal, northern India, N. Burma, northern Indo-China, and S. China.

For a discussion see *S. ocreata.*

Smilax rigida Wall. [Cat. no. 5120 (1830), nom. nud.] ex Kunth, Enum. Pl. **5**: 164 (1850)-A. DC., Monogr. Phaner. **1**: 105 (1878)-Fl. Brit. Ind. **6**: 304 (1892)-T. Koyama, l.c. 73 (1961).

Rimbick-Ramam, 1900-2400 m (May 7, 1960); Bakkim-Jongri, 2500-4000 m (May 19, 1960); Sinduwa, Dhankuta District, 2100 m (Oct. 24, 1963); above Bilbatay Bhanjang, 2800 m (Oct. 26, 1963); Hati Sar-Minchin Dhap, 2700-2800 m (Oct. 28, 1963); Minchin Dhap-Mul Pokhari 2600 m (Oct. 29, 1963); Zongi-Iladanda, 2500 m (Nov. 12, 1963); Baroya Khimty-Thakma Khola, 2500-3300 m (Nov. 16, 1963); Batasay-Bhuspate Danra, 2400-2900 m (Dec. 1, 1963).

Distr. E. Himalaya.

Smilax Wightii A. DC., Monogr. Phaner. **1**: 174 (1878)-Fl. Brit. Ind. **6**: 310 (1892)-T. Koyama, l.c. 42 (1961).

Peshok, 900 m (Apr. 27, 1960).

Distr. E. Himalaya, and Nilghiri Hills.

New to the flora of eastern Himalaya.

Streptopus simplex D. Don, Prodr. Fl. Nepal. 48 (1825)-Fl. Brit. Ind. **6**: 322 (1892)-Fassett in Rhodora **37**: 93 (1935).

Migothang-Nayathang, 4200-3300 m (Jun. 1, 1960, fl.); Nayathang-Chia Bhanjang, 3500-3100 m (Jun. 2, 1960, fl.); Garibans-Tonglu, 2800-3000 m (Jun. 7, 1960, fl.); Diorali Bhanjang, 3400 m (Nov. 14, 1963).

Distr. Himalaya (Kumaon to NEFA), S. Tibet, N. Burma, and W. China.

Very variable in size; some plants in the alpine region have simple stems only 7 cm high bearing 1 or 2 flowers, while some others have tall branched stems attaining 1 m long with numerous axillary flowers.

Tofieldia himalaica Baker in Journ. Linn. Soc. **17**: 489 (1879)–Fl. Brit. Ind. **6**: 358 (1892)–Franchet in Journ. de Bot. **12**: 226 (1898), ut *T. himalayensis* in p. 230.

Phalut–Sandakphu, 3500 m (Jun. 6, 1960 ; cult. in Tokyo, Jun. 2, 1964, fl.).

Distr. E. Himalaya (Sikkim).

Trillium Govanianum Wallich [Cat. no. 812 (1829), nom. nud.] ex Royle, Ill. Bot. Himal. 384, t. 93, f. 1 (1839)–Fl. Brit. Ind. **6**: 361 (1892)–Spring Fl. Sikkim Himal. f. 95 (1963).

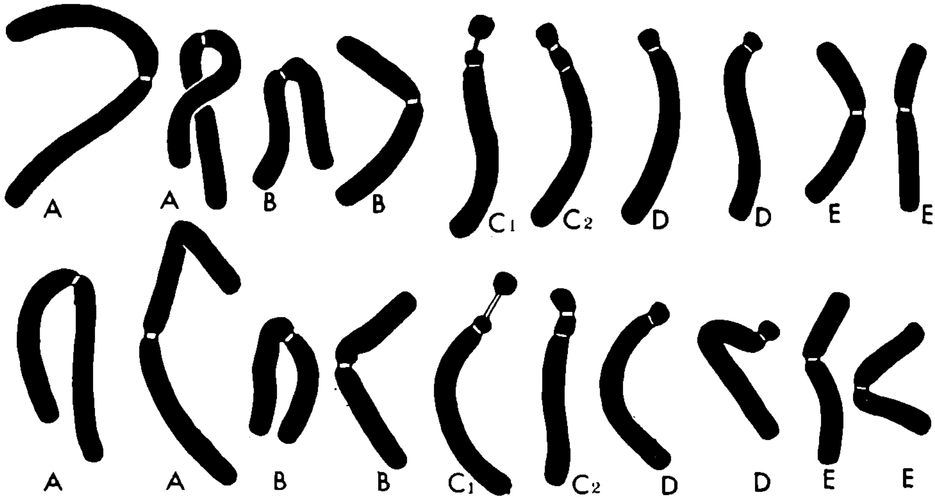

Fig. 28 Somatic chromosomes of *Trillium Govanianum* Wallich, ×870. (del. H. Watanabe)

Trillidium Govanianum (Wall.) Kunth, Enum. Pl. **5**: 120 (1850).

Phalut–Chia Bhanjang, 3300 m (May 11, 1960, no. 189, fl.); Migothang–Nayathang, 3900–3300 m (Jun. 1, 1960, no. 723, fl.); Phalut, 3500 m (Jun. 5, 1960, fl.).

Distr. Himalaya (Kashmir to Sikkim).

The root-tip material fixed by Hara at Phalut was cytologically examined by Prof. T. Haga and Mr. H. Watanabe of Kyushu University. The plant was proved to have 20 chromosomes with 2 satellites (Pl. 24 a, b; Fig. 28), and is considered to be allo-tetraploid. (cf. Proc. Jap. Acad. **42**: 160, 1966).

HYPOXIDACEAE (by Hiroshi Hara)

Curculigo capitulata (Lour.) O. Kuntze, Rev. Gen. Pl. **2**: 703 (1891).

Leucoium capitulatum Loureiro, Fl. Cochinch. 199 (1790).

Curculigo recurvata Dryander in Aiton, Hort. Kew. ed. 2, **2**: 253 (1811)–Fl. Brit. Ind. **6**: 278 (1892).

Molineria recurvata (Dryand.) Herbert, Amaryl. 84 (1837)–Brackett in Rhodora **25**: 161 (1923).

Tista, 300 m (Apr. 26, 1960, fl.); Rimbick–Ramam, 1900–2400 m (May 7, 1960, bud); Gangtok–Saramsa Medicinal Garden, 1600–1100 m (Jun. 17, 1960, fl.); Taplejung–Garhi Danra, 1900–2200 m (Nov. 3, 1963).

Distr. Subtropical Himalaya, south to Ceylon, Burma, Indo-China, China, Malaysia, and Australia.

Curculigo crassifolia (Baker) Hooker f., Fl. Brit. Ind. **6**: 279 (1892).

Molineria crassifolia Baker in Journ. Linn. Soc. **17**: 121 (1878).

Below Siling Tzokupa, 2800 m (Nov. 21, 1963, fr.); Bhuspate Danra–Mai Majuwa, 3000–1600 m (Dec. 3, 1963).

Distr. E. Himalaya (Nepal, Sikkim), and Khasia.

Hypoxis aurea Loureiro, Fl. Cochinch. 200 (1790)–Fl. Brit. Ind. **6**: 277 (1892).

H. minor D. Don, Prodr. Fl. Nepal. 53 (1825).

Pamianchi–Tingling Bridge, 2000–1000 m (May 15, 1960, fl.); Gangtok, 1650 m (Jun. 15, 1960, fl.); Kakani, 2200 m (Sep. 24, 1963, fl. & fr.).

Distr. Himalaya (Kashmir to Sikkim), India, Burma, Indo-China, Malaysia, China, and S. & C. Japan.

The Himalayan specimens agree well with the Japanese ones.

DIOSCOREACEAE (by Hiroyoshi Ohashi)

Dioscorea alata L., Sp. Pl. ed. 1, 1033 (1753)–Hook. f., Fl. Brit. Ind. **6**: 296 (1892)–R. Knuth in Pfl.-reich IV–43, Ht. **87**: 265 (1924)–Prain & Burkill in Ann. Bot. Gard. Calcut. **14**: 302, pl. 123–125 (1938)–Burkill in Fl. Males. **4** (3): 330 (1951).

Bharomdin–Tharpu, 1000–1200 m (Nov. 25, 1963).

Distr. Originated in continental Asia, but now cultivated widely in tropics.

Dioscorea bulbifera L., Sp. Pl. ed. 1, 1033 (1753)–R. Knuth, l.c. 88 (1924), p.p.–Prain & Burkill, l.c. 111, pl. 49–51 (1936) et 420 (1938)–Fl. Males. **4**: 311 (1951).

D. sativa Thunberg, Fl. Jap. 151 (1784); non L. (1753)–Fl. Brit. Ind. **6**: 295 (1892), excl. syn. cit. *D. Cliffortiana.*

Happy Valley, Darjeeling, 2000 m (Jun. 26, 1960, bud); Dhara Pani–Dhankuta, 900–1200 m (Oct. 17, 1963, fr.); Dumhan, Taplejung Dist., 800 m (Oct. 31, 1963, fr.); Sanichare, 200 m (Dec. 10, 1963, fr.).

Distr. Tropics of the Old World.

Dioscorea deltoidea Wallich [Cat. no. 5100 (1831–32), nom. nud.] ex Kunth, Enum. Pl. **5**: 340 (1850)–Fl. Brit. Ind. **6**: 291 (1892), p.p.–R. Knuth, l.c. 174 (1924)–Prain & Burkill, l.c. 25, pl. 4 (1936).

D. nepalensis Sweet, Hort. Brit. ed. 1, 413 (1827); ed. 2, 522 (1830), nom. nud.

Yoksam, 1800 m (May 17, 1960, no. 603, ♂ fl.).

Distr. Himalaya (Hazara to Sikkim), Indo-China, and W. China (Yunnan, Szechuan).

Dioscorea glabra Roxburgh, Fl. Ind. ed. 2, **3**: 804 (1832)–Fl. Brit. Ind. **6**: 294 (1892)–R. Knuth, l.c. 277 (1924), p.p.–Prain & Burkill, l.c. 354, pl. 131 (1938)–Fl. Males. **4**: 331 (1951).

Kakani Hill, 2200 m (Sep. 24, 1963); Dhara Pani–Dhankuta, 900–1200 m (Oct.

17, 1963); Dhankuta, 1200 m (Oct. 19, 1963, fr.).

Distr. Subtropical Himalaya (Simla to Sikkim), India, Burma, Thai, and Malaysia.

Dioscorea hispida Dennstedt, Schlüss. Hort. Malab. 15 (1818)–R. Knuth, l.c. 131 (1924)–Prain et Burkill, l.c. 188, pl. 77 & 78 (1936)–Fl. Males. **4**: 318 (1951).

D. daemona Roxburgh, Fl. Ind. ed. 2, **3**: 805 (1832)–Fl. Brit. Ind. **6**: 289 (1892).

Pakyong–Rhenock, 1300 m (Mar. 19, 1963, fr.).

Distr. Himalaya (Simla to Bhutan), India, Burma, Thai, Indo-China, Malaysia, China, and Formosa.

Dioscorea kamoonensia Kunth, Enum. Pl. **5**: 395 (1850)–Prain & Burkill in Journ. Asia. Soc. Beng. n.s. **10**: 21 (1914); in Ann. Bot. Gard. Calcut. **14**: 146, pl. 62–64 (1936).

D. kumaonensis Hooker f., Fl. Brit. Ind. **6**: 290 (1892).

Garhi Danra–Tuwa, 2200–1800 m (Nov. 4, 1963).

Distr. Himalaya (Kumaon to Bhutan), N. Burma, N. Thai, Indo-China, and China (Yunnan, Szechuan, Kweichow, Hupeh).

Dioscorea melanophyma Prain et Burkill in Journ. Asia. Soc. Beng. n. s. **4**: 452 (1908)–R. Knuth, l.c. 139 (1924), cum *D. Tenii* R. Knuth–Prain & Burkill in Ann. Bot. Gard. Calcut. **14**: 143, pl. 61 (1936).

Kakani, 2200 m (Sep. 24, 1963).

Distr. Himalaya (Kashmir to Nepal), S. Khasia, and W. China (Yunnan, Kweichow).

Dioscorea pentaphylla L., Sp. Pl. ed. 1, 1032 (1753)–Fl. Brit. Ind. **6**: 289 (1892)–R. Knuth, l.c. 145 (1924), excl. var. *lunata* Roth–Prain & Burkill, l.c. 160, pl. 57, 66–67 (1936) et 422 (1938)–Fl. Males. **4**: 315 (1951).

Dhankuta, 1200 m (Oct. 19, 1963, ♀ fl. & fr.; Oct. 20, 1963, ♀ fl. & fr.); Dumhan-Taplejung, 700–1900 m (Nov. 1, 1963).

Distr. Himalaya (Simla to Mishmi), India, Burma, Thai, Indo-China, Malaysia, and China (Yunnan, Kwangtung).

IRIDACEAE (by Hiroshi Hara)

Belamcanda chinensis (L.) DC. in Redouté, Liliac. **3**: t. 121 (1805)–Fl. Brit. Ind. **6**: 277 (1892).

Ixia chinensis L., Sp. Pl. ed. 1, **1**: 36 (1753).

Dhara Pani–Illam, 1500–1200 m (Dec. 5, 1963).

Distr. Himalaya (escaped?), China, Korea, and Japan.

The Himalayan plants have generally very tall stems.

Iris Clarkei Baker, Handb. Irid. 25 (1892)–Fl. Brit. Ind. **6**: 275 (1892)–Bot. Mag. t. 8323 (1910)–Dykes, Gen. Iris 29, t. 5 (1913)–Spring Fl. Sikkim Himal. f. 89–92 (1963).

I. himalaica Dykes in Gard. Chron. **45**: 3 & 36 (1909).

Phalut, 3500 m (Jun. 3, 1960, no. 641, fr.; Jun. 5, 1960, no. 657, fl.); Phalut–Sandakphu, 3500 m (Jun. 6, 1960, fl.).

Distr. E. Himalaya (E. Nepal to Bhutan), and S. Tibet.

The species is near to *Iris sanguinea* Donn ex Hornem. (1813) of Japan and East Siberia, but the latter has fistulose stems, erect inner tepals, narrower capsules acute at both ends, and smaller seeds.

ZINGIBERACEAE (by Hiroshi Hara)

Amomum subulatum Roxburgh, Corom. Pl. **3**: 75, t. 277 (1820)–Fl. Brit. Ind. **6**: 240 (1892)–Schumann in Pfl.-reich IV–46, Ht. **20**: 253, f. 31 (1904).

Happy Valley, Darjeeling, 2000 m (Apr. 9 & Jun. 26, 1960, fl.); Ratong Chu–Yoksam, 1000–1700 m (May 16, 1960, fl.); Illam, 1200 m (Dec. 7, 1963).

Distr. E. Himalaya (Nepal, Sikkim).

Cautleya gracilis (Smith) Dandy in Journ. Bot. **70**: 328 (1932).

Roscoea gracilis Smith in Trans. Linn. Soc. **13**: 460 (1822).

R. elatior Smith, l.c. 460 (1822).

Roscoea lutea Royle, Ill. Bot. Himal. 361, t. 89, f. 2 (1839).

Cautleya lutea Royle, l.c. 361 (1839), nom. provis.–Hook. f. in Bot. Mag. t. 6991 (1888)–Fl. Brit. Ind. **6**: 208 (1890)–Schumann, l.c. 123 (1904).

Chia Bhanjang–Dentam, 3100–1400 m (May 11, 1960, fl.); Dentam–Pamianchi, 1800–2000 m (May 12, 1960, no. 235, fl.); Gangtok, 1500 m (Jun. 15, 1960, fr.); Darjeeling, 2000 m (Jun. 18, 1963).

Distr. Himalaya (Kashmir to Sikkim), Khasia, Manipur, and W. China.

Cautleya spicata (Smith) Baker in Fl. Brit. Ind. **6**: 209 (1890)–Schumann, l.c. 125 (1904)–Collett, Fl. Siml. 512, f. 170 (1921).

Sinduwa, 2100 m (Oct. 24, 1963, fr.).

Distr. Himalaya (Simla to Sikkim).

Costus speciosus (Koenig) Smith in Trans. Linn. Soc. **1**: 249 (1791)–Fl. Brit. Ind. **6**: 249 (1892)–Schumann, l.c. 398 (1904)–Holttum in Gard. Bull. **13**: 242, f. 31 & 32 (1950).

Banksea speciosa Koenig in Retzius, Observ. Bot. **3**: 75 (1783).

Costus nipalensis Roscoe, Monandr. Pl. t. 80 (1828).

Dhara Pani–Tamur Bridge, 300 m (Oct. 17, 1963); near Dumhan, 900 m (Oct. 30, 1963, fr.); Tuwa–Taplethok, 1800–1400 m (Nov. 5, 1963, fr.); Illam–Ranga Pani, 1200–400 m (Dec. 8, 1963); Ghorwa–Sanichare, 300–200 m (Dec. 10, 1963, fr.); Kathgara–Rangali, 200 m (Dec. 14, 1963, fr.); Rangali–Biratnagar, 200 m (Dec. 15, 1963).

Distr. Himalaya, south to Ceylon, Indo-China, Formosa, and Malaysia, south to New Guinea.

Curcuma aromatica Salisbury, Parad. Lond. t. 96 (1807)–Fl. Brit. Ind. **6**: 210 (1890)–Schumann, l.c. 111 (1904).

Kalimpong, 1300 m (Apr. 22, 1960, fl.); Peshok–Lopchu, 900–1500 m (Apr. 27, 1960, no. 2317, fl.).

Distr. E. Himalaya, south to Ceylon.

Globba Clarkei Baker in Fl. Brit. Ind. **6**: 201 (1890)–Schumann, l.c. 134, f. 19 D (1904).

Gokarna Forest, Kathmandu, 1500 m (Sep. 22, 1963, fl.); Darjeeling, 2100 m (Sep. 21, 1964, fl.); Dhankuta, 1200 m (Oct. 19, 1963); Helok–Iladanda, 1500–1800 m (Nov. 8, 1963, fr.).

Distr. E. Himalaya (Nepal, Sikkim), Khasia, and Manipur.

The group including *Globba Hookeri* C. B. Clarke, *G. orixensis* Roxb., *G. racemosa* Smith, etc. needs critical reexaminations. Our collections have leaves pubescent beneath with thin longer hairs, narrow glabrous often bulbiferous racemes, and long slender corolla-tubes, but may not belong to a single species.

Globba macroclada Gagnepain in Bull. Soc. Bot. France **50**: 257 (1903)-Schumann, l.c. 134, f. 19 A (1904).

Tista, 300 m (Jun. 19 & 20, 1960, fl.).

Distr. E. Himalaya (Sikkim).

Hedychium acuminatum Roscoe, Monandr. Pl. t. 47 (1828)-Hand.-Mzt., Symb. Sin. **7**: 1320 (1936).

H. spicatum var. *acuminatum* (Roscoe) Wallich in Journ. Bot. Kew Gard. **5**: 328 (1853)-Fl. Brit. Ind. **6**: 227 (1892)-Schumann, l.c. 50 (1904).

Darjeeling, 2150 m (Sep. 10, 1964, fl.).

Distr. Himalaya (Kumaon to Sikkim), and W. China.

Hedychium coccineum Hamilton in Rees, Cyclop. **17**: no. 5 (1811)-Fl. Brit. Ind. **6**: 231 (1892)-Schumann, l.c. 51 (1904).

Rayang, 250 m (Apr. 21, 1960, no. 1835); Yektin-Akasay, 1400-2300 m (Nov. 30, 1963, fr.); Ranga Pani-Ghorwa, 700-300 m (Dec. 9, 1963).

Distr. C. & E. Himalaya, Khasia, Burma, and Indo-China.

Hedychium ellipticum Hamilton ex Rees, Cyclop. **17**: no. 2 (1811)-Roscoe, l.c. t. 55 (1828)-Fl. Brit. Ind. **6**: 228 (1892)-Schumann, l.c. 47 (1904)-Spring Fl. Sikkim Himal. f. 220 (1963).

Gangtok-Rangpo, 1000 m (Jun. 18, 1960, fl.).

Distr. Himalaya (Garhwal to Sikkim), and Khasia.

Hedychium flavescens Carey ex Roscoe, l.c. t. 50 (1828)-Schumann, l.c. 46 (1904).

H. coronarium var. *flavescens* (Carey) Baker in Fl. Brit. Ind. **6**: 226 (1892).

Dhankuta-Hilay, 1200-2000 m (Oct. 23, 1963, fl.).

Distr. Himalaya.

Hedychium Gardnerianum Roscoe, l.c. t. 62 (1828)-Fl. Brit. Ind. **6**: 230 (1892)-Schumann, l.c. 56 (1904).

Yoksam-Bakkim, 1700-2200 m (May 18, 1960, fr.); Penlong La, 2100 m (Mar. 18, 1963, fr.).

Distr. E. Himalaya (Nepal, Sikkim), and Khasia.

Hedychium glaucum Roscoe, l.c. t. 53 (1828)-Schumann, l.c. 57 (1904).

H. gracile var. *glaucum* (Roscoe) Baker in Fl. Brit. Ind. **6**: 229 (1892).

Phusri-Sanguri Bhanjang, 450-1200 m (Oct. 16, 1963, fr.); Iladanda-Helok, 1800-1500 m (Nov. 13, 1963, fr.).

Distr. E. Himalaya (Nepal to Bhutan), and Khasia.

Hedychium thyrsiforme Hamilton ex Smith in Rees, Cyclop. **17**: no. 4 (1811)-Roscoe, l.c. t. 56 (1828)-Fl. Brit. Ind. **6**: 230 (1892)-Schumann, l.c. 57 (1904).

Illam-Ranga Pani, 1200-400 m (Dec. 8, 1963); Ghorwa-Sanichare, 300-200 m (Dec. 10, 1963, fr.).

Distr. Himalaya (Kumaon to Sikkim), Manipur, and E. Pakistan.

Kaempferia rotunda L., Sp. Pl. ed. 1, **1**: 3 (1753)–Fl. Brit. Ind. **6**: 222 (1890)– Schumann, l.c. 87 (1904)–Holttum in Gard. Bull. **13**: 121, f. 14 (1950).

Kalimpong, cult. in Tokyo (Apr. 17, 1963, fl.).

Distr. Himalaya, India, and Indo-China.

Roscoea alpina Royle, Ill. Bot. Himal. 361, t. 89, f. 1 (1839)–Fl. Brit. Ind. **6**: 207 (1890)–Schumann, l.c. 117 (1904)–Collett, Fl. Siml. 509, f. 169 (1921)–Cowan in New Fl. & Silv. **11**: 20 (1938)–Spring Fl. Sikkim Himal. f. 87 (1963).

Sandakphu–Kala Pokhari, 3200 m (Jun. 7, 1960, fl.).

Distr. Himalaya (Kashmir to Sikkim).

Roscoea purpurea J. E. Smith, Exot. Bot. **2**: 97, t. 108 (1804)–Bot. Mag. t. 4630 (1852)–Fl. Brit. Ind. **6**: 207 (1890)–Schumann, l.c. 119 (1904)–Cowan, l.c. 23 (1938).

Kakani, 2100–2200 m (Sep. 24, 1963, fl.).

var. **auriculata** (Schum.) Hara, comb. nov.

R. auriculata Schumann, l.c. 118 (1904).

Siling Tzokupa 3000 m (Nov. 21, 1963; cult. in Tokyo, May-Jun. 1964, fl.).

Distr. var. Himalaya (Kumaon to Bhutan), and S. Tibet.

var. **gigantea** Wallich, Pl. Asia. Rar. **3**: 22 (1832).

R. procera Wallich, Pl. Asia. Rar. **3**: t. 242 (1832).

R. purpurea var. *procera* Wall., Cat. no. 6528 C (1832), nom. nud.–Fl. Brit. Ind. **6**: 208 (1890)–Schumann, l.c. 120 (1904).

Siling Tzokupa, 2600 m (Nov. 21, 1963 ; cult. in Tokyo, Jul. 1964, fl.).

Distr. var. Himalaya (Simla to Sikkim).

The specimen from Kakani agrees with the typical form of *R. purpurea*, but has light pink flowers. Var. *auriculata* differs from the type in having leaves distinctly auricled at the base, and long-exserted corolla-tube. On an open grassy ridge of Siling Tzokupa at ca. 3000 m high, var. *auriculata* with deep violet flowers forms a pure colony. While, below the ridge of the same peak at ca. 2600 m high, var. *gigantea* occurs in a small open place in the *Quercus semecarpifolia* forest. It has more robust stems, broader leaves auricled at the base, and larger light mauve flowers.

CANNACEAE (by Hiroshi Hara)

Canna edulis Ker-Gawler in Bot. Reg. **9**: t. 775 (1824)–Bot. Mag. t. 2498 (1824)–Kränzlin in Pfl.-reich IV–47, Ht. **56**: 64 (1912).

Tuwa–Taplethok, cult., 1800–1400 m (Nov. 5, 1963, fl.); Khebang, cult., 1400 m (Nov. 23, 1963, fl.); Illam, cult., 1200 m (Dec. 7, 1963, fl.).

Distr. Native of S. America and W. Indies; cultivated for its edible tubers.

MARANTACEAE (by Hiroshi Hara)

Phrynium placentarium (Lour.) Merrill in Philip. Journ. Sci. **15**: 230 (1919); in Trans. Amer. Philos. Soc. n. s. **24** (2): 120 (1935).

Phyllodes placentaria Loureiro, Fl. Cochinch. 13 (1790).

Phrynium parviflorum Roxburgh, Fl. Ind. ed. Carey, **1**: 7 (1820)–Roscoe, Monandr. Pl. t. 34 (1828)–Fl. Brit. Ind. **6**: 259 (1892)–Schumann in Pfl.-reich IV–48, Ht. **11**: 54 (1902)–Larsen in Dansk Bot. Ark. **23**: 178 (1965).

Ranga Pani–Ghorwa, 700–300 m (Dec. 9, 1963).
Distr. E. Himalaya, Khasia, Thai, Indo-China, Malaya?, and S. China.

BURMANNIACEAE (by Hiroshi Hara)

Burmannia nepalensis (Miers) Hooker f. in Fl. Brit. Ind. **5**: 666 (1888)-Jonker in Meded. Bot. Mus. Utrecht **51**: 155 (1938). [Fig. 27]

Gonyanthes nepalensis Miers in Trans. Linn. Soc. **18**: 537, t. 38, f. 1 (1841).

Near Helok, 1600 m, under *Thamnocalamus* thicket in evergreen forests (Nov. 6 & 9, 1963, fl. & fr.).

Distr. E. Himalaya (Nepal), Khasia, Indo-China, S. China, and Philippines.

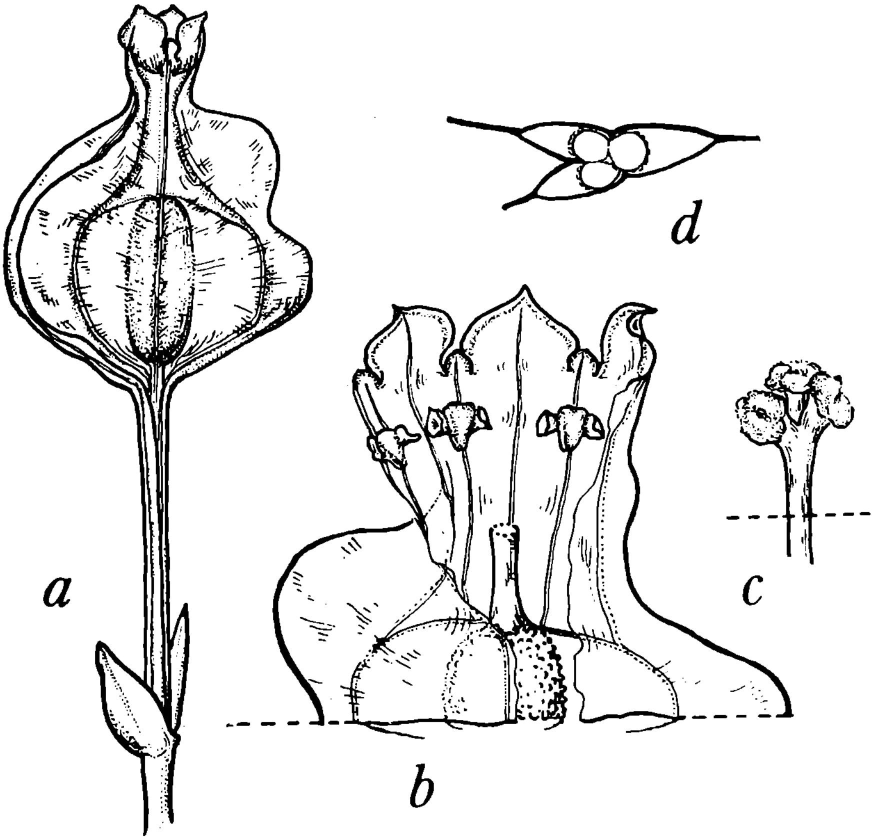

Fig. 27. *Burmannia nepalensis* Hooker f. a. Flower, ×8. b. The upper part of corolla expanded, ×16. c. Stigma, ×16. d. Cross section of ovary, ×8.

The whole plants are pure white, but the lobes of the corolla are deep yellow. *B. liukiuensis* Hayata (1915) from south Kyushu and Ryukyu of Japan, and *B. Steenisii* Jonker (1938) from Java are very closely allied to this species, and may be conspecific with *B. nepalensis*.

ORCHIDACEAE (by Takasi Tuyama)

Acriopsis Harai Tuyama in Journ. Jap. Bot. **39**: 129, f. 1, pl. 3 (1964).

In the vicinity of Gangtok, ca. 1000 m (Apr. 25, 1960--Typus in TI).

Distr. Endemic.

This species marks the northernmost area of the genus *Acriopsis*, the centre of distribution being in the Malay Archipelago. By mistake, the collector of this new species was reported to be Mr. Togashi, but actually the collector was Prof. Hara and the gentleman who sent this to Tokyo was Mr. Togashi.

Aerides multiflorum Roxburgh, Pl. Corom. **3**: 63, t. 271 (1820); Fl. Ind. ed. 2, **3**: 475 (1832)–Fl. Brit. Ind. **6**: 44 (1890)–King et Pantl., Orch. Sikkim. 212, t. 283 (1898)–Holttum, Orch. Malay. 694 (1953)–Seidenf. et Smitin., Orch. Thail. 548 (1963).

Ghorwa–Sanichare, 300–200 m (Dec. 10, 1963).

Distr. Tropical Himalaya (Garhwal to Sikkim), Khasia, and Burma.

Agrostophyllum callosum Reichenbach f. in Seemann, Fl. Vit. 296 (1865–68)–Fl. Brit. Ind. **5**: 824 (1890)–King et Pantl., Orch. Sikkim. 155, t. 212 (1898)–Seidenf. et Smitin., Orch. Thail. 318 (1960)–Spring Fl. Sikkim Himal. 127, f. 190 (1963).

Ghatte–Khebang, 1600–2400 m (Nov. 19, 1963).

Distr. Subtropical Himalaya (Nepal, Sikkim), Burma, S. Thai, and Malaysia to Java and Borneo.

We have collected many species belonging to this genus, but the flowers were too old, and it was impossible to identify them except this one.

Anthogonium gracile Lindley, Gen. Sp. Orch. 426 (1840)–Fl. Brit. Ind. **5**: 822 (1890)–King et Pantl., Orch. Sikkim. 96, t. 134 (1898)–Seidenf. et Smitin., Orch. Thail. 327, f. 249 (1961).

Sunderijal Waterfall, 1600 m (Sep. 20, 1963); Kakani Hill, 2100–2200 m (Sep. 24, 1963); Taplejung–Garhi Danra, 1900–2200 m (Nov. 3, 1963); Taplethok–Helok, 1400–1500 m (Nov. 6, 1963); Helok, 1500 m (Nov. 9, 1963); Darjeeling, 2150 m (Sep. 10, 1964); Happy Valley, 1900 m (Jun. 26, 1960, fr.)

Distr. Temperate Himalaya (Nepal, Sikkim), Khasia, Naga Hills, and Burma.

Anthogonium corydaloides Schlechter, Orch. Sino-Jap. 66 et 230 (1919) from Yunnan of China comes very near to this one.

Arundina graminifolia (D. Don) Hochreutiner in Bull. New York Bot. Gard. **6**: 270 (1910)–Holttum, Orch. Malay. 186 (1953)–Seidenf. et Smitin., Orch. Thail. 184 (1959).

Bletia graminifolia D. Don, Prodr. Fl. Nepal. 29 (Feb. 1825).

Arundina speciosa Blume, Bijdr. 401 (Jun.–Dec. 1825)–J. J. Smith, Fl. Buit. **6**: 229, t. 168 (1910).

Arundina bambusifolia Lindley, Gen. Sp. Orch. 125 (1831)–Fl. Brit. Ind. **5**: 857 (1890)–King et Pantl., Orchid. Sikkim. 113, t. 156 (1898)–Spring Fl. Sikkim Himal. 127, f. 188–189 (1963).

Cymbidium bambusifolium Roxburgh, Fl. Ind. ed. 2, **3**: 460 (1832).

Happy Valley, Darjeeling, 1900 m (Apr. 10 & Jun. 26, 1960); Kalimpong, 1300 m (Jun. 20, 1960); Iladanda–Helok, 1800–1500 m (Nov. 12, 1963); Tharpu–Chyangthaphu, 1200–1300 m (Nov. 26, 1963); Ranga Pani–Ghorwa, 700–300 m (Dec. 9, 1963); Ghorwa–Sanichare, 300–200 m (Dec. 10, 1963); Kathgara–Rangali, 200m (Dec. 14, 1963).

Distr. Temperate Himalaya (Nepal, Sikkim), Assam, Khasia, Peninsular India, Burma, Thai, Malaysia to Tahiti, and S. China.

Bulbophyllum affine Lindley, Gen. Sp. Orch. 48 (1830)–Fl. Brit. Ind. **5**: 756 (1890)–King et Pantl., Orch. Sikkim. 67, t. 91 (1898)–Seidenf. et Smitin., Orch. Thail. 378, f. 285 (1961)–Spring Fl. Sikkim Himal. 128, f. 198 (1963).

Gangtok, 1000 m (Jun. 16, 1960).

Distr. Sutropical Himalaya (Nepal, Sikkim), Khasia, and Naga Hills.

Bulbophyllum Careyanum Sprengel, Syst. Veg. **3**: 732 (1826)–Fl. Brit. Ind. **5**: 760 (1890)–King et Pantl., Orch. Sikkim. 71, t. 97 (1898)–Seidenf. et Smitin., Orch. Thail. 428, f. 321 (1961).

Anisopetalum Careyanum Hooker, Exot. Fl. t. 149 (1825).

Phusri–Dhara Pani, 450–1200 m (Oct. 16, 1963).

Distr. Tropical Himalaya (Nepal), Khasia, and Burma.

Seidenfaden and Smitinand's figures and descriptions are somewhat different in many respects from ours. Further investigation on the type specimen of this plants is needed.

Bulbophyllum caudatum Lindley, Gen. Sp. Orch. 56 (1830)–Fl. Brit. Ind. **5**: 759 (1890).

Cirrhopetalum caudatum King et Pantl., Orch. Sikkim. 93, t. 129 (1898).

Near Gangtok (Apr. 26?, 1960, coll. no. 6–10 in Sikkim).

Distr. E. Himalaya (Nepal, Sikkim).

This was cultivated in the greenhouse of Shinjuku-Gyoen Botanic Garden of Tokyo, and flowered on May 4, 1964.

Bulbophyllum cylindraceum Lindley, Gen. Sp. Orch. 53 (1830)–Wall., Pl. Asia. Rar. **1**: 69 (1830)–Fl. Brit. Ind. **5**: 765 (1890)–King et Pantl., Orch. Sikkim. 70, t. 96 (1898).

Ghatte-Khebang, 1600-2400 m (Nov. 19, 1963).

Distr. Subtropical Himalaya (Nepal, Sikkim), and Khasia.

The flowers deep purple, lip densely papillose, deeply and sharply grooved at the base, and the coulmn with the tridentate apical processes.

Bulbophyllum Gamblei (Hooker f.) Hooker f., Icon. Pl. t. 2039, B (1890)–Fl. Brit. Ind. **6**: 188 (1890)–King et Pantl., Orch. Sikkim. 82, t. 113 (1898)–Spring Fl. Sikkim Himal. 128, f. 199 (1963).

Bulbophyllum leptanthum Hooker f. var.? *Gamblei* Hooker f., Fl. Brit. Ind. **5**: 759 (1890).

Ghum, 2300 m (Jun. 22, 1960).

Distr. Endemic.

This is quite different from *Cirrhopetalum Gamblei* Hook. f., Fl. Brit. Ind. **5**: 778 (1890); Icon. Pl. t. 2058 (1891). The type specimen of var.? *Gamblei* Hook. f. was collected by Gamble " at Goompahar, alt. 7000 ft." This locality may be same as our place of collection.

Bulbophyllum hymenanthum Hooker f., Fl. Brit. Ind. **5**: 767 (1890)–King et Pantl., Orch. Sikkim. 76, t. 103 (1898)–Seidenf. et Smitin., Orch. Thail. 394, f. 297 (1961).

Yoksam, 1700 m (May 17, 1960).

Distr. Sikkim, and Khasia.

Bulbophyllum leopardinum (Wallich) Lindley, Gen. Sp. Orch. 48 (1830)–Fl. Brit. Ind. **5**: 756 (1890)–King et Pantl., Orchid. Sikkim. 67, t. 92 (1898).

Dendrobium leopardinum Wallich, Tent. Fl. Napal. 39, t. 28 (1826).

Sarcopodium leopardinum (Wall.) Lindley in Paxt., Fl. Gard. **1**: 155 (1851).

Taplejung, 1700 m (Nov. 2, 1963); Taplejung–Garhi Danra, 1700–2200 m (Nov. 3, 1963).

Distr. Subtropical Himalaya (Nepal, Sikkim), and Khasia.

Although we have only collected the specimens with old flowers, the crowded pseudobulbs, stout flower stalks arising from the base of the pseudobulbs, inflated membranaceous sheaths at their bases, and very coriaceous elliptic oblong leaf-blades convince me to belong to this species.

Bulbophyllum odoratissimum (Smith) Lindley, Gen. Sp. Orch. 55 (1830)–Fl. Brit. Ind. **5**: 758 (1890)–King et Pantl., Orchid. Sikkim. 79, t. 109 (1898)–Schlechter, Orch. Sino-Jap. 249 (1919)–Seidenf. et Smitin., Orch. Thail. 400, f. 302 (1961).

Stelis odoratissima Smith in Rees, Cyclop. 34 (1816).

Ratong Chu, 1000 m (May 16, 1960).

Distr. Subtropical Himalaya (Nepal to Sikkim), Khasia, Burma, and W. China (Yunnan).

Bulbophyllum ornatissimum (Reichenbach f.) J. J. Smith in Bull. Jard. Bot. Buit. ser. 2, **8**: 26 (1912).

Cirrhopetalum ornatissimum Reichenbach f. in Gard. Chron. **1882** (2): 424 (1882)–Fl. Brit. Ind. **5**: 773 (1890)–King et Pantl., Orch. Sikkim. 95, t. 133 (1898).

Sikkim: Sine loco speciali.

Distr. Sikkim, Assam, and Burma.

This flowered in the greenhouse of Koishikawa Botanic Garden on Nov. 9, 1964.

Bulbophyllum parvulum Hooker f., Fl. Brit. Ind. **5**: 778 (1890); Icon. Pl. t. 2060 A (1891)–King et Pantl., Orch. Sikkim. 92, t. 128 (1898).

Hati Sar–Minchin Dhap, 2700–2900 m (Oct. 28, 1963); Minchin Dhap–Mul Pokhari, 2900–2500 m (Oct. 29, 1963); Selap–Walunchung Gola, 2600–3800 m (Nov. 10, 1963); Bhuspate Danra–Mai Majua, 3100–1700 m (Dec. 3, 1963).

Distr. Temperate E. Himalaya (E. Nepal, Sikkim).

The dorsal sepals are a little shorter than half the length of lateral sepals, but are not so short as described by J. D. Hooker.

Bulbophyllum reptans Lindley, Gen. Sp. Orch. 51 (1830)–Fl. Brit. Ind. **5**: 768 (1898)–King et Pantl., Orch. Sikkim. 77, t. 106 (1898).

Chyangthaphu–Birwa, 1300–2400 m (Nov. 27, 1963).

Distr. Temperate Himalaya (E. Nepal to Bhutan (var.)), Khasia, and Naga Hills.

Bulbophyllum triste Reichenbach f. in Walpers, Ann. **6**: 253 (1861)–Fl. Brit. Ind. **5**: 768 (1890)–King et Pantl., Orch. Sikkim, 73, t. 98 (1898).

E. Nepal, sine loco speciali (Jul. 4, 1963, fl. in Tokyo).

Distr. Sikkim, and Burma (Tenasserim).

This bore flowers on May 4, 1964 at Koishikawa Botanic Garden. The petals and sepals were viridescent.

Bulbophyllum viridiflorum (Hooker f.) Schlechter in Orchis **4**: 108 (1910).

Cirrhopetalum viridiflorum Hooker f., Fl. Brit. Ind. **5**: 779 (1890); Icon. Pl. t. 2061 (1891)–King et Pantl., Orch. Sikkim. 86, t. 118 (1898).

Garhi Danra–Tuwa, 2200–1800 m (Nov. 4, 1963); Iladanda–Helok, 1800–1500 m (Nov. 13, 1963); Khebang–Siling Tzokupa, 1700–2100 m (Nov. 20, 1963); Chyangthaphu–Birwa, 1300–2400 m (Nov. 27, 1963).

Distr. Sikkim, and Khasia.

Bulbophyllum Wallichii (Lindley) Reichenbach f. in Walpers, Ann. **6**: 259 (1861).

Cirrhopetalum Wallichii Lindley in Wallich, Pl. Asia. Rar. **1**: 53, t. 67 (1830)–Fl. Brit. Ind. **5**: 776 (1890)–King et Pantl., Orch. Sikkim. 88, t. 121 (1898).

Hati Sar–Minchin Dhap, 2700–2900 m (Oct. 28, 1963); Baroya Khimty, 2500 m (Nov. 11, 1963); Batasay–Bhuspate Danra, 2400–2800 m (Dec. 1, 1963); Bhuspate Danra, 2800 m (Dec. 2, 1963).

Distr. Temperate Himalaya (Nepal to Sikkim).

Calanthe chloroleuca Lindley, Fol. Orch. 10 (1828–29)–Fl. Brit. Ind. **5**: 856 (1890)–King et Pantl., Orch. Sikkim. 171, t. 231 (1898).

Victoria Fall, Darjeeling, 1900 m (Apr. 10, 1960); Lopchu, 1500 m (Apr. 29, 1960); Batasi, 2000 m (May 2, 1960); Batasi–Palmajua, 2300–2500 m (May 3, 1960).

Distr. E. Himalaya (?Nepal and Sikkim).

We have collected many sterile specimens probably belonging to this species in E. Nepal. As to most others belonging to the genus *Calanthe*, which were out of the flowering season, no identification was made with them.

Cheirostylis Griffithii Lindley in Journ. Linn. Soc. **1**: 188 (1857)–Fl. Brit. Ind. **6**: 105 (1890)–King et Pantl., Orch. Sikkim. 299, t. 397 (1898).

Near Saramsa, 1100 m (Jun. 17, 1960).

Distr. Sikkim, and Khasia.

This was determined by the unicate specimen collected and photographed by Prof. H. Hara. This is near to *C. flabellata* Wight from Bhutan etc., but the lip is differently shaped. Lindley and J. D. Hooker do not mention of the glandular hairs of the flowers.

Coelogyne corymbosa Lindley, Fol. Orch. 7 (1855)–Bot. Mag. t. 6955 (1887) –Fl. Brit. Ind. **5**: 831 (1890)–King et Pantl., Orch. Sikkim. 134, t. 185 (1898)–Schlecht., Orch. Sino-Jap. 183 (1919)–Spring Fl. Sikkim Himal. 128, f. 204 (1963).

Batasi–Palmajua, 2300–2600 m (May 3, 1960); Ramam, 2400 m (May 8, 1960); Hati Sar–Minchin Dhap, 2700–2900 m (Oct. 28, 1963); Helok–Baroya Khimty, 1500–2500 m (Nov. 10, 1963); Ghatte, 2500–1600 m (Nov. 16, 1963); Yektin–Batasay, 1400–2400 m (Nov. 30, 1963); Batasay–Bhuspate Danra, 2400–2800 m (Dec. 1, 1963).

Distr. Temperate E. Himalaya (from Sikkim eastwards), Khasia, and China (Yunnan).

This is a little near to *C. ochracea* Lindley, but the flowers are larger and fewer in number on the scape. The lip has two long lamellae and a third short one at the middle base of it, and no denticulation on the anterior margin of the side lobes as seen in *C. ochracea*.

Coelogyne cristata Lindley, Col. Bot. t. 33 (1821)–Fl. Brit. Ind. **5**: 829 (1890)–King et Pantl., Orch. Sikkim. 132, t. 184 (1898)–Kitam. in Faun. & Fl. Nepal Himal. 99, f. 10 (1955).

Happy Valley, Darjeeling, 1900 m (Apr. 10, 1960); Thakma Khola–Bhandukay, 3100–2500 m (Nov. 14, 1963); Bhandukay–Ghatte, 2500–1600 m (Nov. 16, 1963).

Distr. Temperate Himalaya (Kumaon to Sikkim), and Khasia.

In some author's view, *Cymbidium speciosissimum* is identical with this one. If so, a new combination should be made of this earliest epithet under *Coelogyne.*

Coelogyne elata Lindley, Gen. Sp. Orch. 40 (1830)–Wall., Pl. Asia. Rar. **3**: 12, t. 218 (1831–32)–Fl. Brit. Ind. **5**: 838 (1890)–King et Pantl., Orch. Sikkim. 136, t. 188 (1898).

Tuwa–Taplethok, 1800–1400 m (Nov. 5, 1963).

Distr. Subtropical Himalaya (Garhwal to Bhutan), and N. Burma.

We met with this only in one spot. The specimen bears a very young scape.

Coelogyne flavida Wallich ex Hooker f., Fl. Brit. Ind. **5**: 839 (1890)–King et Pantl., Orch. Sikkim. 138, t. 191 (1898)–Seidenf. et Smitin., Orch. Thail. 129, f. 96 (1959).

Ratong Chu, at Tingling Bridge, 1500 m (May 15, 1960); Tuwa–Taplethok, 1500 m (Nov. 5, 1963); above Helok, 1500 m (Nov. 8, 1963).

Distr. Sikkim, and Khasia.

Coelogyne longipes Lindley, Fol. Orch. 10 (1852)–Fl. Brit. Ind. **5**: 839 (1890) –King et Pantl., Orch. Sikkim. 136, t. 189 (1898)–Seidenf. et Smitin., Orch. Thail. 126, f. 94–95 (1959).

Helok–Iladanda, 1500–1800 (Nov. 8, 1963, fr.).

Distr. Sikkim, Khasia, Naga Hills, and Thai.

Coelogyne ochracea Lindley in Bot. Reg. **1846**: t. 69 (1846); Fol. Orch. 5 (1854)–Fl. Brit. Ind. **5**: 831 (1890)–King et Pantl., Orch. Sikkim. 132, t. 182 (1898).

Batasi–Palmajua, 2300–2600 m (May 3, 1960); Ratong Chu, at Tingling Bridge, 1000 m (May 15, 1960); Yoksam, 1700 m (May 17, 1960); Chyangthaphu–Birwa, 1300–2400 m (Nov. 27, 1963); Yektin–Akasay, 1400–2300 m (Nov. 30, 1963).

Distr. Temperate Himalaya (Kumaon to Bhutan).

Cremastra appendiculata (D. Don) Makino in Bot. Mag. Tokyo **18**: 24 (1904)–Schlechter, Orch. Sino-Jap. 225 (1919), in nota–Y. Kimura in Nakai, Icon. Pl. Asia. Or. **3**: 274, t. 97 (1940)–Spring Fl. Sikkim Himal. 127, f. 192 (1963).

Cymbidium appendiculata D. Don, Prodr. Fl. Nepal. 36 (1825).

Cremastra Wallichiana Lindley, Gen. Sp. Orch. 173 (1833).

Hyacinthorchis variabilis Blume, Mus. Bot. Lugd.-Bat. **1**: 48 f. 16 (1849)–Fl. Brit. Ind. **6**: 16 (1890)–King et Pantl., Orch. Sikkim. 182, t. 246 (1898).

Mani Bhanjang–Batasi, 2000–2100 m (May 1, 1960, fl.)

Distr. Temperate E. Himalaya (Nepal, Sikkim).

There are many discussions whether this is accepted to be a species widely distributed to China, S. Korea, and Japan or to be a local one confined to the Himalayan region. Further investigation is needed for the definite conclusion.

Cryptochilus lutea Lindley in Journ. Linn. Soc. **3**: 21 (1859)–Fl. Brit. Ind. **5**: 827 (1890)–King et Pantl., Orch. Sikkim. 163, t. 221 (1898).

Tharpu–Khunga Chuli, 1200–2300 m (Nov. 27, 1963); Tharpu–Chyangthaphu, 1200–1300 m (Nov. 26, 1963); Birwa–Yektin, 2900–1600 m (Nov. 28, 1963).

Distr. Temperate Himalaya (Nepal to Bhutan), Manipur, and Kohima.

Cryptochilus sanguinea Wallich, Tent. Fl. Napal. 36, t. 26 (1826)–Lindl., Gen. Sp. Orch. 193 (1833); in Journ. Linn. Soc. **3**: 21 (1859)–Bot. Reg. t. 23 (1838)–Wight, Icon. t. 1757 (1851)–Fl. Brit. Ind. **5**: 827 (1890)–King et Pantl., Orch. Sikkim. 163, t. 220 (1898).

Ghatte–Khebang, 1600–2400 m (Nov. 19, 1963).

Distr. Subtropical Himalaya (Nepal to Sikkim), Khasia, and Naga Hills.

Cymbidium Devonianum Paxton, Mag. Bot. **10**: 97, c. icon. (1843)–Fl. Brit. Ind. **6**: 10 (1890)–King et Pantl., Orch. Sikkim. 190, t. 253 (1898).

Helok–Iladanda, 1500–1800 m (Nov. 8, 1963).

Distr. Sikkim, and Khasia.

This seems to be very rare in the districts we have botanized. Although the specimen is sterile, the long stout canaliculated petioles articulated at the base, and the general appearance of the plant suggest to belong to this species.

Cymbidium elegans Lindley, Gen. Sp. Orch. 163 (1833).

Cypeorchis elegans Blume, Rumphia **4**: 47, in nota (1836); Fl. Jav. **4**: 93, t. 48. C (1858)–Fl. Brit. Ind. **6**: 14 (1890)–King et Pantl., Orch. Sikkim. 159, t. 259 (1898)–Schlecht., Orch. Sino-Jap. 266 (1919).

Ramam, Kali Khola, (May 9, 1960, fl.); Ratong Chu–Tingling Bridge, 1000 m (May 16, 1960); Yoksam–Bakkim (May 18, 1960); Mul Pokhari–Dumhan, 2500–700 m (Oct. 30, 1963); Ghatte–Khebang, 1600–2400 m (Nov. 19, 1963); Tharpu–Chyangthaphu, 1200–1300 m (Nov. 26, 1963); Chyangthaphu–Birwa, 1300–2400 m (Nov. 27, 1963).

Distr. Subtropical Himalaya (Nepal to Bhutan), Khasia, Naga Hills, Manipur, and China (Yunnan).

Cymbidium grandiflorum Griffith, Icon. Pl. Asia. t. 321 (1847); Notul. **3**: 342 (1851)–Fl. Brit. Ind. **6**: 12 (1890)–King et Pantl., Orch. Sikkim. 192, t. 256 (1898)–Schlecht., Orch. Sino-Jap. 268 (1919)–Spring Fl. Sikkim Himal. 128, f. 202–203 (1963).

Ramam, Kali Khola, 2300 m (May 9, 1960, fl.); Sinduwa, 2100 m. (Oct. 24, 1963, fl. juven.); Baroya Khimty, 2500 m (Nov. 11, 1963, fl. juven.); Birwa-Yektin, 2900–1600 m (Nov. 28, 1963, fl. juven. et fr. matur.).

Distr. Subtropical E. Himalaya (E. Nepal to Bhutan).

The long fimbriate hairs on the margin of the lip are very distinctive character of this species.

Cymbidium longifolium D. Don, Prodr. Fl. Nepal. 36 (1825)–Lindley, Gen. Sp. Orch. 163 (1833)–Fl. Brit. Ind. **6**: 13 (1890)–King et Pantl., Orch. Sikkim. 191, t. 254 (1898)–Schlecht., Orch. Sino-Jap. 269 (1919).

Cymbidium erythraeum Lindley in Journ. Linn. Soc. **3**: 30 (1859).

Minchin Dhap–Mul Pokhari, 2900–2500 m (Oct. 29, 1963); Helok–Iladanda, 1500–1800 m (Nov. 8, 1963); Ghatte–Khebang, 1600–2400 m (Nov. 19, 1963); Tharpu–

Khunga Chuli, 1200–2300 m (Nov. 27, 1963); Birwa–Yektin, 2900–1600 m (Nov. 28, 1963).

Distr. Subtropical Himalaya (Garhwal to Sikkim), Khasia, Naga Hills, and China (Szechuan, Yunnan, Hupeh).

The flowers are smaller in size and have no marginal fimbriate hairs on the lip as seen in *C. grandiflorum* Griffith.

Cymbidium pendulum (Roxburgh) Swartz in Nov. Act. Soc. Sci. Upsal. **6**: 73 (1799)–King et Pantl., Orch. Sikkim. 188, t. 251 (1898)–Schlecht., Orch. Sino-Jap. 271 (1919).

Epidendrum pendulum Roxburgh, Pl. Corom. **1**: 35, t. 44 (1795).

Cymbidium aloifolium Loddiges, Bot. Cab. **10**: t. 967 (1825); non Swartz 1799.

Khebang–Bharomdin, 1700–1000 m (Nov. 24, 1963).

Distr. Sikkim, Assam, Peninsular India, Burma, Malaya, and China.

Only the fruiting specimen. The character of leaves mentioned by King and Pantling only suggests the specimen to belong to this species.

Cymbidium simulans Rolfe in Orch. Rev. **25**: 175 (1917)–Holttum, Orch. Malay. 519 (1953)–Seidenf. et Smitin., Orch. Thail. 508, f. 373, pl. 21, f. 2094 (1961).

Cymbidium aloifolium Swartz sensu Hook. f., Fl. Brit. Ind. **6**: 10 (1890)–King et Pantl., Orch. Sikkim. 189, t. 252 (1898).

Tista Bazer, 350 m (Jun. 19, 1960); Illam–Ranga Pani, 1200–400 m (Dec. 8, 1963); Ranga Pani–Ghorwa, 700–300 m (Dec. 9, 1963).

Distr. Tropical E. Himalaya (E. Nepal to Sikkim), Assam, Peninsular India, Ceylon, Andaman Is., and ?China.

There are calli in two series on the lip, that is long hirsute beneath. There are many disputes concerning the identity of *Cymbidium aloifolium* Swartz and others. J. D. Hooker made long mention on this problem. Schlechter distinguished *Cymbidium pendulum* Sw. from "China" (ex Rolfe) specifically from *C. aloifolium* Sw. from India by many floral characters. On our poor specimens nothing can be said safely in this connections.

Dendrobium ampulum Lindley, Gen. Sp., Orch 74 (1830)–Fl. Brit. Ind. **5**: 711 (1890)–King et Pantl., Orch. Sikkim. 63, t. 89 (1898).

Epigeneium ampulum (Lindley) Summerhayes in Kew Bull. **1957** (2): 260 (1957).

Tuwa–Taplethok, 1800–1400 m (Nov. 5, 1963).

Distr. Tropical Himalaya (Nepal, Sikkim), Assam, and Khasia.

Dendrobium anceps Swartz in Act. Holm. 246 (1800)–Roxb., Fl. Ind. ed. 2, **3**: 487 (1832)–Fl. Brit. Ind. **5**: 724 (1890)–King et Pantl., Orch. Sikkim. 41, t. 54 (1898)–Seidenf. et Smitin., Orch. Thail. 267 (1960).

Tista Bazar, 350 m (Apr. 22, 1960); Illam–Ranga Pani, 1200–400 m (Dec. 8, 1963).

Distr. Tropical Himalaya (Nepal, Sikkim), Assam, Bengal, Burma, Thai, and Indo-China.

Dendrobium candidum Wallich ex Lindley, Bot. Reg. **1838**: Misc. 54 (1838)–Fl. Brit. Ind. **5**: 735 (1890)–King et Pantl., Orch. Sikkim. 49, t. 63 (1898).

Ramam, 2400 m (May 8, 1960); Ratong Chu, 1000 m (May 15, 1960, ster.); Zongi–Iladanda, 2800–1800 m (Nov. 12, 1963, ster.); Iladanda–Helok, 1800–1500 m (Nov. 13, 1963).

Abundant elsewhere. We have found similar species belonging perhaps to the section, Nigrohirsutae. The specimen (Dentam–Pamianchi, 2000 m, May 12, 1960) has the smaller flower with rounded chin of lip, but owing to the bad condition of the specimen it was indeterminable.

Dendrobium densiflorum Lindley ex Wallich, Pl. Asia. Rar. **1**: 34, t. 40 (1830)–Lindley, Gen. Sp. Orch. 90 (1830)–Fl. Brit. Ind. **5**: 748 (1890)–King et Pantl., Orch. Sikkim. 56, t. 79 (1898)–Kitam. in Faun. & Fl. Nepal Himal. 102, f. 11 (1955).

Pamianchi, 2000 m (May 13 & 14, 1960, cult.).

Distr. Tropical Himalaya (Nepal, Sikkim), Khasia, and Burma.

Dendrobium eriaeflorum Griffith [Icon. Pl. Asia. 307 (1847), ut *D. eriflorum*]–Hook. f., Fl. Brit. Ind. **5**: 715 (1890)–King et Pantl., Orch. Sikkim. 44, t. 61 (1898)–Holttum, Orch. Malay. 308 (1953)–Seidenf. et Smitin., Orch. Thail. 235 (1960).

Darjeeling, 2100 m (Apr. 10, 1960); Taplethok–Helok, 1400–1500 m (Nov. 6, 1963); Helok, 1500 m (Nov. 8, 1963); Iladanda–Selap, 1800–2600 m (Nov. 9, 1963, fr. juven.); Zongi–Iladanda, 2800–1800 m (Nov. 12, 1963, fr. juven.); Birwa–Yektin, 2900–1600 m (Nov. 28, 1963, fr. juven.).

Distr. Temperate E. Himalaya (E. Nepal, Sikkim), Khasia, and Thai, to N. Malaya.

The color of the flower seems to be very variable. The texture of the petals and sepals are thin and semitranslucent streaked with rosy violet. The lips are more densely colored.

Dendrobium longicornu Lindley, Gen. Sp. Orch. 80 (1830); in Journ. Linn. Soc. **3**: 16 (1859)–Fl. Brit. Ind. **5**: 720 (1890)–King et Pantl., Orch. Sikkim. 46, t. 64 (1898).

Kurseong, 1600 m (Apr. 12, 1960); Bilbatay Bhanjang, 2200 m (Oct. 25, 1963); Minchin Dhap–Mul Pokhari, 2900–2500 m (Oct. 29, 1963); Mul Pokhari–Dumhan, 2500–700 m (Oct. 30, 1963); Tharpu–Chyangthaphu, 1200–1300 m (Nov. 26, 1963); Chyangthaphu–Birwa, 1300–2400 m (Nov. 27, 1963).

Distr. Temperate Himalaya (Nepal, Sikkim), Khasia, and Naga Hills.

Flowers from October to November. Fruits with very long stipes attaining to about 4 cm.

Dendrobium Macraei Lindley, Gen. Sp. Orch. 75 (1830); in Journ. Linn. Soc. **3**: 6 (1859)–Fl. Brit. Ind. **5**: 714 (1890)–King et Pantl., Orch. Sikkim. 61, t. 86 (1898)–Schlechter, Orch. Sino-Jap. 213 (1919).

Ephemeranthus Macraei (Lindl.) P. F. Hunt et Summerhayes in Taxon **10**: 105 (1961).

Tuwa–Taplethok, 1800–1400 m (Nov. 5, 1963); Taplethok–Helok, 1400–1500 m (Nov. 6, 1963).

Distr. Sikkim, Khasia, Concan, Nilghiris, and Java.

The specimen with fruits leads us scarcely to identify with this species.

Dendrobium nobile Lindley, Gen. Sp. Orch. 79 (1830)–Fl. Brit. Ind. **5**: 740 (1890)–King et Pantl., Orch. Sikkim. 51, t. 71 (1898)–Schlecht., Orch. Sino-Jap. 213 (1919)–Holttum, Orch. Malay. 288 (1953)–Seidenf. et Smitin., Orch. Thail. 210, t. 10-f. 895 (1960)–Spring Fl. Sikkim Himal. 128, t. 197 (1963).

Pamianchi, 2000 m (May 14, 1960, fl.).

Distr. Subtropical Himalaya (Sikkim, Bhutan), Assam, Burma, Thai, Laos, China (Hupeh, Szechuen), and Formosa (var.).

Dendrobium Pierardi Roxburgh in Hook. f., Exot. Fl. t. 9 (1822)–Fl. Brit. Ind. **5**: 738 (1890)–King et Pantl., Orch. Sikkim. 51, t. 72 (1898)–Seidenf. et Smitin., Orch. Thail. 217, f. 166 (1960)–Spring Fl. Sikkim Himal. 127, f. 196 (1963).

Kalimpong, 1300 m (Apr. 22, 1960, cult.?); Gangtok, 1600 m (Jun. 16, 1960); Mul Pokhari–Dumhan, 2500–700 m (Oct. 30, 1963); Khebang–Bharomdin, 1700–1000 m (Nov. 24, 1963); Khunga Chuli–Yektin, 2000–1400 m (Nov. 28, 1963); Illam–Ranga Pani, 1200–700 m (Dec. 8, 1963); Ranga Pani–Ghorwa, 700–300 m (Dec. 9, 1963).

Distr. Tropical Himalaya (E. Nepal, Sikkim), Bengal, Burma, Thai, Indo-China, Malaya, and China (Yunnan).

Copious everywhere.

Dendrobium porphyrochilum Lindley in Journ. Linn. Soc. **3**: 18 (1859)–Fl. Brit. Ind. **5**: 716 (1890)–King et Pantl., Orch. Sikkim. 44, t. 59 (1898).

Dentam–Pamianchi (May 12, 1960, fl.); Ghum–Kurseong, 2200 m (Jun. 22, 1960, fr. juven.).

Distr. Sikkim, and Khasia.

It was found rarely high up on the trunk of trees. Flowers yellow (section Stachyobium). It reminds us some species of *Eria*.

Doritis taenialis (Lindley) Bentham in Bentham et Hooker f., Gen. Pl. **3**: 574 (1883)–Fl. Brit. Ind. **6**: 31 (1890)–King et Pantl., Orch. Sikkim. 199, t. 266 (1898)–Spring Fl. Sikkim Himal. 127, t. 194 (1963).

Aerides taeniale Lindley, Gen. Sp. Orch. 239 (1833); in Journ. Linn. Soc. **3**: 41 (1859).

Lopchu, 1500 m (Apr. 28, 1960); Dentam–Pamianchi, 1500–2000 m (May 12, 1960, fruct.); Ratong Chu, at Tingling Bridge, 1000 m (May 16, 1960, fl.); Yoksam, 1700 m (May 17, 1960, fl.); Dumhan–Taplejung (Oct. 31, 1963); Taplejung, 1700 m (Nov. 2, 1963); Tuwa–Taplethok, (Nov. 5, 1963); Iladanda–Helok, (Nov. 13, 1963).

Distr. Subtropical Himalaya (Kumaon to Bhutan), Khasia, and Burma.

Eria coronaria (Lindley) Reichenbach f. in Walpers, Ann. **6**: 272 (1861)–King et Pantl., Orch. Sikkim. 124, t. 172 (1898)–Schlechter, Orch. Sino-Jap. 217 (1919).–Seidenf. et Smitin., Orch. Thail. 300 (1960).

Coelogyne coronaria Lindley, Bot. Reg. Misc. 83 (1841).

Trichosma suavis Lindley in Bot. Reg. t. 21 (1842)–Fl. Brit. Ind. **5**: 827 (1890).

Kurseong, 1600 m (Apr. 12, 1960); Garhi Danra–Tuwa, 2200–1800 m (Nov. 4, 1963); Helok–Iladanda (Nov. 8, 1963); Iladanda–Helok, 1800–1500 m (Nov. 13, 1963); Thakma Khola–Bhandukay (Nov. 14, 1963); Ghatte–Khebang, 1600–2400 m (Nov. 19, 1963); Tharpu–Khunga Chuli, 1200–2300 m (Nov. 27, 1963); Kathgara–Rangali, 200 m (Dec. 14, 1963); Darjeeling, hillside of Birch Hill, 2100 m (Dec. 28, 1963).

Distr. Sikkim, Khasia, and China (Yunnan).

Flower white, and lip dark purple maculated, yellowish in the centre (fide Prof. H. Hara).

Eria discolor Lindley in Journ. Linn. Soc. **3**: 51 (1859)–Fl. Brit. Ind. **6**: (1890)–Hook. f. in Ann. Bot. Gard. Calcut. **5**: 21, t. 32 (1895).

Tylostylis discolor Hooker ex King et Pantl., Orch. Sikkim. 130, t. 180 (1898).
Eria pulchella Hooker f., Fl. Brit. Ind. **5**: 802 (1890), p.p.; **6**: 190 (1890).
Gangtok, 1000 m (Jun. 17, 1960).
Distr. Sikkim, and Khasia.

Eria excavata Lindley ex Hooker f., Icon. Pl. t. 1846 (1889)–Lindl., Gen. Sp. Orch. 67 (1830), p.p.–Fl. Brit. Ind. **5**: 795 (1890)–King et Pantl., Orch. Sikkim. 124, t. 171 (1890).

Dentam–Pamianchi, 1500–2000 m (May 12, 1960); Darjeeling, 2100 m (Jun. 21 & 23, 1960).

Distr. Temperate Himalaya (Nepal, Sikkim), and Khasia.

Eria flava Lindley, Gen. Sp. Orch. 65 (1830); in Journ. Linn. Soc. **3**: 49 (1859).

var. **lanata** Hooker f., Fl. Brit. Ind. **5**: 801 (1890).
Rayang, 200 m (Apr. 21, 1960, no. 1853).
Distr. sp. Tropical Himalaya (Garhwal to Bhutan), and Sikkim (var.).

Eria graminifolia Lindley in Journ. Linn. Soc. **3**: 54 (1859)–Hook. f., Icon. Pl. t. 1847 (1889)–Fl. Brit. Ind. **5**: 794 (1890)–King et Pantl., Orch. Sikkim. 119, t. 164 (1898).

Murhay–Bilbatay Bhanjang, 2100–2200 m (Oct. 30, 1963); Mul Pokhari–Dumhan, 2500–700 m (Oct. 30, 1963); Batasay–Bhuspate Danra, 2400–2800 m (Dec. 1, 1963).

Distr. Temperate E. Himalaya (E. Nepal, Sikkim).

Although the specimens were all sterile, the slender pseudobulbs with leaves approximated at the top of them, and the puberulous inflorescence rather laxely flowered sustained by the small widely ovate bracts convince me to determine with this species.

Eria muscicola Lindley in Journ. Linn. Soc. **3**: 47 (1859)–Fl. Brit. Ind. **5**: 789 (1890)–Seidenf. et Smitin., Orch. Thail. 289, t. 217 (1960).

Dendrobium muscicola Lindley, Gen. Sp. Orch. 75 (1830).
Iladanda–Helok, 1800–1500 m (Nov. 13, 1963).
Distr. E. Himalaya (E. Nepal, Sikkim), Assam, Ceylon, Burma, and Thai.

Eria pannea Lindley, Bot. Reg. Misc. 64 (1842)–Fl. Brit. Ind. **5**: 804 (1890)–King et Pantl., Orch. Sikkim., 127, t. 176 (1898)–Schlecht., Orch. Sino-Jap. 219 (1919)–Holttum, Orch. Malay. 377 (1953)–Seidenf. et Smitin., Orch. Thail. 294 (1960)–Spring. Fl. Sikkim Himal. 128, f. 200–201 (1963).

Pinalia pannea (Lindley) O. Kuntze, Rev. Gen. Pl. **2**: 679 (1891).
Below Gangtok, 1000 m (Jul. 17, 1960).

Distr. Subtropical Himalaya (Sikkim), Lower Burma, Sumatra, Malaya, and S. China (Yunnan, Hainan).

Gastrochilus affinis (King et Pantling) Schlechter in Fedde, Rep. **12**: 314 (1913).

Saccolabium affine King et Pantl., Orch. Sikkim. 228, t. 304 (1898).
Hati Sar–Minchin Dhap, 2700–2900 m (Oct. 28, 1963).
Distr. Temperate E. Himalaya (E. Nepal, Sikkim).

This was originally described from the specimen collected by Pantling above Pamianchi. King and Pantling stated on this species as follows. "This comes very near to *Saccolabium distichum* and *S. pseudo-distichum*, and ought possibly to be treated as a variety rather than a species." I can not agree with their opinion at least as to *Gastrochilus affinis* and *G. distichus*, because the former has smaller flowers and their sacs of the lips are narrowly conical ending in slightly bilobate apices, moreover apical lobes of the lip is quite differently shaped, that is to say, they are not suborbicular as in *G. distichus*, but transversely elongate with the small obtuse tip and irregular dentation on the lateral margins. In addition to these, in the centre of the middle lobe of this species, there seems to lie two longitudinal lamellae. This kind seems very rare in the district we have botanized.

Gastrochilus calceolaris (Smith) D. Don, Prodr. Fl. Nepal. 32 (1825)-Holttum, Orch. Malay. 657 (1953)-Ames et Quisumb. in Philip. Journ. Sci. **49**: 495, pl. 2, f. 1-3 (colored), pl. 11, f. 1-8, et pl. 25 (1932)-Seidenf. et Smitin., Orch. Thail. 632, f. 474 (1963). [Pl. 7 c]

Aerides calceolare Hamilton ex Smith in Rees, Cyclop. **39**: no. 11 (1818).

Saccolabium calceolare (Smith) Lindley, Gen. Sp. Orch. 223 (1833)-Fl. Brit. Ind. **6**: 60 (1890)-King et Pantl., Orch. Sikkim., 225, t. 300 (1898)-J. J. Smith, Fl. Buit. **6**: 632. f. 472 (1910).

Takdah, 1600 m (Apr. 18, 1960); Chia Bhanjang-Dentam, 2000-1500 m (May 11, 1960); Yoksam, 1700 m (May 17, 1960); Helok-Iladanda, 1500-1800 m (Nov. 19, 1963); Ghatte-Khebang, 1600-2400 m (Nov. 23, 1963).

Distr. Tropical Himalaya (Garhwal to Bhutan), Assam, Khasia, Lower Burma, Malaya, Sumatra, Java, and Philippines.

Judging from the plate of Ames and Quisumbing, the Philippine plant seems more intensely maculated than ours.

Gastrochilus distichus (Lindley) O. Kuntze, Rev. Gen. Pl. **2**: 661 (1891).

Saccolabium distichum Lindley in Journ. Linn. Soc. **3**: 36 (1859)-Fl. Brit. Ind. **6**: 64 (1890)-King et Pantl., Orch. Sikkim., 227, t. 303 (1898).

Darjeeling, 2200 m (Apr. 10, 1960); Sinduwa, 2100 m (Oct. 24, 1963); Murhay-Bilbatay Bhanjang, 2100-2200 m (Oct. 24, 1963); Bilbatay Bhanjang, 2200 m (Oct. 25 & 26, 1963); Chyangthaphu-Birwa, 1300-2400 m (Nov. 27, 1963); Mul Pokhari-Dumhan (Oct. 30, 1963); Birwa-Yektin, 2900-1600 m (Nov. 28, 1963).

Distr. Temperate Himalaya (E. Nepal, Sikkim).

From the boiled flower specimen, I have found disk-formed callose part in the centre of the middle lobe of the lip. At the posterior end of this callus, two blunt calli are disposed transversely as described by Hooker f. and King et Pantling.

Goodyera foliosa (Lindl.) Bentham ex Hooker f., Fl. Brit. Ind **6**: 113 (1890)-King et Pantl., Orch. Sikkim. 281, t. 374 (1898)-Schlecht., Orch. Sino-Jap. 163 (1919)-Ridley, Fl. Malay Penins. **4**: 220 (1924)-Holttum, Orch. Malay. 121 (1953).

Georchis foliosa Lindley, Gen. Sp. Orchid. 496 (1840).

Goodyera bifida Blume sensu Makino, Ill. Fl. Jap. t. 38, a-b (1888).

G. Maximowicziana Makino in Bot. Mag. Tokyo **23**: 137 (1909)-Ohwi, Fl. Jap. ed. 2, 432 (1965).

Tharpu-Khunga, 2300 m (Nov. 27, 1963); Tendong Peak, 2800 m (Mar. 26, 1963).

Distr. Temperate Himalaya (E. Nepal, Sikkim), Khasia, Naga Hills, Burma, Malaya, China (Kwangtung), Korea, and Japan (from Yakushima I. north to Ishikari prov., Hokkaido).

As already mentioned by Schlechter in 1919, *G. foliosa* of Himalaya and the adjacent regions is very near to *G. Maximowicziana* of Japan and Korea, and, judging from the descriptions by Hooker f. and, King and Pantling, it appears to be stouter in growth, and has larger leaves, slightly larger flowers, and longer bracts, as compared with the latter. We have collected these plants in two spots in E. Nepal and Sikkim, growing under the shade of trees. They were sent to Tokyo, and cultivated by Prof. Hara at Karuizawa (alt. 1000 m) of middle Honshu. They began to flower overthere from 1965. On examining the flowers under the microscope, they showed quite the same morphological characters as those of Japanese *G. Maximowicziana*. The most characteristic feature of both species that is not found in any other related species lies in the occurrence of multicellular blunt-tipped papilla-like hairs on the bracts and scapes. Although the size of the leaf-blades of our plants was somewhat reduced during the course of cultivation in Japan, says Prof. Hara, the leaves are not so large as described by J. D. Hooker and others, when they were seen at the habitat. In conclusion, I would like to reduce *G. Maximowicziana* to a synonym of *G. foliosa*. I will attribute the difference in size to the local environmental difference.

Goodyera hispida Lindley in Journ. Linn. Soc. **1**: 183 (1857)–Fl. Brit. Ind. **6**: 114 (1890)–King et Pantl., Orch. Sikkim. 282, t. 375 (1898)–Holttum, Orch. Malay. 121 (1935).

Yoksam–Bakkim, 1700–2200 m (May 18, 1960).

Distr. Sikkim, Khasia, and Malaya.

Goodyera procera Hooker f., Exot. Fl. 39 (1823)–Fl. Brit. Ind. **5**: 111 (1890)–King et Pantl., Orch. Sikkim. 282, t. 278 (1898)–Schlecht., Orch. Sino-Jap. 166 (1919)–Seidenf. et Smitin., Orch. Thail. 76, f. 57 (1959).

Happy valley, Darjeeling, 1900 m (Apr. 10 & Jun. 26, 1960).

Distr. Subtropical Himalaya (Garhwal to Assam), Khasia, Peninsular India, Ceylon, Burma, Thai, Indo-China, Malaysia, W. China (Yunnan), Formosa, and S. Japan.

Goodyera repens (L.) R. Brown in Aiton, Hort. Kew. ed. 2, **5**: 198 (1813)–Fl. Brit. Ind. **6**: 111 (1890)–King et Pantl., Orch. Sikkim 279, t. 370 (1898)–Schlecht., Orch. Sino-Jap. 166 (1919).

Satyrium repens L., Sp. Pl. ed. 1, 945 (1753).

Goodyera marginata Lindley, Sp. Gen. Orch. 493 (1840).

Goodyera repens R. Brown subsp. *marginata* (Lindl.) Kitam., Color. Ill. Herb. Pl. Jap., Monocot. 40 (1964); in Act. Phytotax. Geobot. **22**: 66 (1966).

Bilbatay Bhanjang–Hati Sar, 2200–2900 m (Oct. 27, 1963).

Distr. sp. Temperate Himalaya (Simla to Sikkim), China (Kansu, Hupeh), Korea, Japan, N. America, and Europe.

This is a unicate specimen we have collected. In this specimen, sepals are almost glabrous, but under the microscope there are in a few instances the shorter hairs but of the same nature as of scapes most sparsely scattered on their backs. Consulting with the all literatures above mentioned, there are variations as to the density of indumentum of the scape. My view is that notwithstanding the separation of ssp. *marginata* by Prof. Kitamura from the mother species, the subspecies fall in the variation of the mother species even in the Himalayan regions.

Goodyera vittata Bentham ex Hooker f., Fl. Brit. Ind. **6**: 113 (1890)–King et Pantl., Orch. Sikkim. 280, t. 382 (1898).

Baroya Khimty, 2500 m (Nov. 11, 1963).

Distr. E. Himalaya (E. Nepal, Sikkim).

This is determined only by the unicate sterile specimen with the leaves silvery striated on the midrib and white-reticulated at the apex of the blade.

Habenaria bicornuta Hook. f., Fl. Brit. Ind. **6**: 156 (1890).

Peristylis Richardianus Wight, Icon. t. 1697 (1851).

Murhay, 2000 m (Oct. 24, 1963); Baroya Khimty, 2500 m (Nov. 11, 1963).

Distr. Nepal, Western Ghat (Nilghiris), and Pulney Hills.

This seems very rare in the area we have passed. By existence of the earlier name, *Habenaria Richardiana* Wight for another plant, *Peristylis Richardianus* Wight (1851) can not be taken up under the genus *Habenaria* as basionym of this species.

Habenaria densa Wallich ex Lindley, Gen. Sp. Orch. 326 (1835)–Fl. Brit. Ind. **6**: 153 (1890)–King et Pantl., Orch. Sikkim. 319, t. 420 (1898)–Kränzl., Orch. Gen. Sp. **1**: 443 (1901).

Hilay–Murhay (Oct. 23, 1963); Sinduwa, 2100 m (Oct. 24, 1963); Murhay–Bilbatay Bhanjang, 2100–2200 m (Oct. 24, 1963); Bilbatay Bhanjang–Hati Sar (Oct. 27, 1963); Minchin Dhap–Mul Pokhari, 2900–2500 m (Oct. 29, 1963); Mul Pokhari–Dumhan (Oct. 30, 1963); Baroya Khimty, 2500 m (Nov. 11, 1963); Baroya Khimty–Thakma Khola (Nov. 12 & 16, 1963); Thakma Khola–Bhandukay (Nov. 14, 1963); Bhandukay, 2400 m (Nov. 15, 1963); Siling Tzokupa (Nov. 21, 1963); Batasay–Bhuspate Danra (Dec. 1, 1963); Darjeeling, 2150 m (Sep. 15, 1964).

Distr. Temperate Himalaya (Simla to Sikkim).

We were a little too late in collecting this plant. Fortunately, however, Prof. H. Hara collected this at Darjeeling in September in full blossom. His note shows that petals are greenish yellow and sepals green, or in some individuals flowers are green or greenish yellow as a whole. In the dried specimen, the lower surface of the leaves are much more glaucous compared with any other species of the genus we have collected.

Habenaria dentata (Swartz) Schlechter, Orch. Sino-Jap. 125 (1919)–Hand.-Mzt., Symb. Sin. **7**: 1336 (1936)–Kitamura in Faun. & Fl. Nepal Himal. 103 (1955); in Act. Phytotax. Geobot. **21**: 64 (1964)–Seidenf. et Smitin., Orch. Thail. 39, f. 28, 29 (1959).

Orchis dentata Swartz in Ved. Acad. Handl. Stockh. 207 (1800).

Habenaria geniculata D. Don, Prodr. Fl. Nepal. 25 (1825)–Fl Brit. Ind. **6**: 138 (1890)–King et Pantl., Orch. Sikkim. 309, t. 405, fig. 1–3 (1898).

Platanthera dentata (Swartz) Lindl., Gen. Sp. Orch. 296 (1835).

Dhankuta, 1200 m (Oct. 18–21, 1963), Taplethok-Helok (Nov. 6, 1963); Helok, 1500 m (Nov. 9, 1963).

Distr. Subtropical E. Himalaya (E. Nepal, Sikkim), Khasia, Naga Hills, Burma, Thai, Indo-China, China, and S. Japan.

form. **ecalcarata** (King et Pantling) Tuyama, comb. nov.

Habenaria geniculata D. Don var. *ecalcarata* King et Pantling, Orch. Sikkim. 310, t. 405, fig. 4–5 (1898).

Dhankuta, 1200 m (Oct. 18–20, 1963); Tuwa-Taplethok (Nov. 5, 1963); Ranga Pani-Ghorwa, 700–300 m (Dec. 9, 1963).

Distr. E. Nepal.

This form was stated as spurless by King and Pantling, but there are variations between the form that is safely said to be spurless and the form with very short spur, if there are any, up to 1 mm long. We have collected many diverse forms in the shapes of lips and in some cases of sepals and petals. At first I took these variations to have been caused by some diseases, but now came to the conclusion that these may be due to perolism. This species comes very near to *H. Miersiana* Champ. of Japan, Ryukyu, Formosa, and S. China, but Schlechter took this species distinctive form the latter based on the form of the lip and other characters. Owing to the very much variable nature of the former species, further investigations are expected in this connections. However, at present, I am in favor of Prof. Kitamura's view that *H. Miersiana* should fall in the range of variation of *H. dentata.* Oral information of Prof. Maekawa also points to the same line as mine.

Habenaria goodyeroides D. Don, Prodr. Fl. Nepal. 25 (1825)–Fl. Brit. Ind. **6**: 161 (1890)–King et Pantl., Orch. Sikkim. 326, t. 430 (1898)–Schlecht., Orch. Sino-Jap. 128 (1919)–Holttum, Orch. Malay. 86 (1953).

Peristylis goodyeroides (D. Don) Lindley, Gen. Sp. Orch. 299 (1835)–Royle, Ill. Bot. Himal. t. 87, f. 2 (1835)–J. J. Smith, Fl. Jav. **6**: 32, t. 14 (1908)–Seidenf. et Smitin., Orch. Thail. 51, f. 37 (1959).

Dhankuta, 1200 m (Oct. 18 et 19, 1963); Ranga Pani–Ghorwa, 700–300 m (Dec. 9, 1963).

Distr. Subtropical Himalaya (Kumaon to Bhutan), Khasia, Peninsular India, Burma, Andaman Island, Thai, Cochinchina, China (Yunnan), Malaysia, and Formosa.

Habenaria latilabris (Lindley) Hooker, f., Fl. Brit. Ind. **6**: 153 (1890)–King et Pantl., Orch. Sikkim. 321, t. 423 (1898)–Kränzl., Orch. Gen. Sp. 441 et 907 (1901).

Platanthera latilabris Lindley, Gen. et Sp. Orch. 289 (1835).

Platanthera acuminata Lindley, l.c. 289 (1835).

Hati Sar–Minchin Dhap, 2700–2900 m (Oct. 28, 1963); Minchin Dhap–Mul Pokhari, 2900–2500 m (Oct. 29, 1963); Siling Tzokupa (Nov. 21, 1963).

Distr. Temperate Himalaya (Kashmir to Sikkim), and central part of Peninsular India.

Although we have collected a few number of this group with old flowers only, I am sure that they belong to this species. Dorsal and lateral sepals are ovate-lanceolate, and petals are lanceolate and obtuse. These are a little narrower than described by J. D. Hooker but are included in the descriptions given by King and Pantling. Owing to the bad stage of the flower, the structure of the column can not be well examined, but the rostellum is undoubtedly very short. Of Lindley's two binomials mentioned above, *P. latilabris* is only acceptable under the

International Code of Botanical Nomenclature, because of the former being first adopted under *Habenaria* by J. D. Hooker, and the second as synonymous.

Habenaria stenopetala Lindl., Gen. Sp. Orch. 319 (1835)-Fl. Brit. Ind. **6**: 134 (1890)-King and Pantl., Orch. Sikkim. 308, t. 404 (1898).

Godavari, Kathmandu, 1500 m (Sep. 18, 1963).

Distr. Temperate Himalaya (Kashmir to Sikkim), Naga Hills, Lower Bengal, Orissa, and Concan.

Only one specimen was collected, and it has a good match with Hooker's description.

Herminium angustifolium (Lindl.) Bentham ex Hooker f., Fl. Brit. Ind. **6**: 129 (1890)-King et Pantl., Orch. Sikkim., 334, t. 434 (1898)-Schlecht., Orch. Sino-Jap. 100 (1919)-Seidenf. et Smitin., Orch. Thail. 15, f. 8 (1959).

Aceras angustifolia Lindley, Gen. Sp. Orch. 282 (1835); in Journ. Linn. Soc. **3**: 43 (1859)-Royle, Ill. Bot. Himal. t. 87, f. 1 (1835).

Aceras longicruris C. Wright ex A. Gray in Mem Acad. Philad. ser. 2, **6**: 411 (1859).

Aceras angustifolia Lindley var. *longicruris* (C. Wright) Miq., Prol. 139 (1866).

Herminium angustifolium (Lindley) Bentham ex Hooker var. *longicruris* (C. Wright) Makino in Bot. Mag. Tokyo **10**: 109 (1896)-Schlecht., Orch. Sino-Jap. 100 (1919)-Ohwi, Fl. Jap. ed. 1, 350 (1956).

Herminium longicrure (Wright) Wang et Tang in Act. Phytotax. Sin. **1**: 61 (1951)-Ohwi, Fl. Jap. ed. Eng. 327 (1965); Fl. Jap. ed. 2, 409 (1965).

Kakani Hill, 2100–2200 m (Sep. 24, 1963); Dhankuta–Sinduwa, 1200–2100 m (Oct. 22, 1963); Dhankuta–Hilay (Oct. 23, 1963); Sinduwa, 2100 m (Oct. 23, 1963); Murhay, 2000 m (Oct. 24, 1963); Minchin Dhap–Mul Pokhari, 2900–2500 m (Oct. 29, 1963, c. fl. monstr.); Mul Pokhari–Dumhan, 2500–700 m (Oct. 30, 1963); Baroya Khimty, 2500 m (Nov. 11, 1963); Baroya Khimty–Thakma Khola (Nov. 12, 1963); Siling Tzokupa (Nov. 21, 1963); Darjeeling, 2150 m (Sep. 10 et 15, 1964).

Distr. Temperate Himalaya (from the North West to Sikkim), N. Assam, Khasia, Naga Hills, Burma, Thai, Indo-China, Malaysia and China (Szechuan, Kweichow, Yunnan, Sikang), N. E. China, Korea, and Japan (up to Hokkaido).

The specimen collected in September bore flower and young fruits. The flowers were all pale green. One specimen collected on Oct. 24, 1963 was a perolic form with two lips each.

Miquel reduced *Aceras longicruris* C. Wright described from the Island of Katonashima (Kakeroma I., near Amami-Oshima) to a variety of *A. angustifolia* Lindley collected from Gossain Than of Nepal (Wallich, no. 7061), mentioning that the Japanese plant is different from the Indian one in having lateral lobes of the lip equal to or longer than the basal undivided part. Schlechter took up the form of the lip as characteristic to var. *longicruris* that is oval at the base and manifestly attenuated up to the middle part. However, there are many intermediate forms bridging the mother species and the variety as was considered by Schlechter and others. The good example of illustration of the form with basally broadened lip is seen in J. J. Smith, Fl., Java **6**: t. 7., f. 1–6 at the lower left hand of the plate. The form illustrated here has, however, the lateral lobes of the lip twice or three times shorter than that of the Himalayan and Japanese specimens. I will keep myself backwards and be more cautious not to split the species like this that is believed to be distributed so widely.

Herminium fallax (Lindley) Lindley ex Hook. f., Fl. Brit. Ind. **6**: 129 (1890); Icon. Pl. t. 2198 (1894).

Peristylus fallax Lindley, Gen. Sp. Orch., 298 (1835).

Minchin Dhap-Mul Pokhari, 2900–2500 m (Oct. 29, 1963); Mul Pokhari-Dumhan, 2500–700 m (Oct. 30, 1963).

Distr. Alpine and subalpine Himalaya (Garhwal to Sikkim).

This seemed rather rare in the district we have explored. The trilobate lip with the median lobe exceedingly larger than others, spreading sepals and petals, and membraneous lip might be the manifest characters unique to this species.

Ione bicolor Lindley, Fol. Orch. 3 (1853)–King et Pantl., Orch. Sikkim. 159 et t. 216 (1898).

Sunipia bicolor Lindley, Gen. Sp. Orch. 179 (1833).

Bulbophyllum bicolor (Lindley) Hooker f., Fl. Brit. Ind. **5**: 770 (1890); non *B. bicolor* Lindley, Gen. Sp. Orch. 49 (1830).

Kurseong, 1600 m (Apr. 12, 1960); Takdah, 1600 m (Apr. 19, 1960); Mani Bhanjang-Batasi, 2000–2100 m (May 1, 1960); Yoksam, 1700 m (May 17, 1960); Mul Pokhari-Dumhan (Oct. 30, 1963); Helok–Iladanda, 1500–1800 m (Nov. 8, 1963); above Lelep (Nov. 9, 1963); Iladanda–Selap, 1800–2600 m (Nov. 9, 1963); Yamphodin-Ghatte, 2100–1600 m (Nov. 18, 1963); Khebang–Siling Tzokupa, 1700–2100 m (Nov. 20, 1963); Chyangthaphu–Birwa, 1300–2400 m (Nov. 27, 1963).

Distr. Temperate Himalaya (Nepal to Bhutan), and Khasia.

Very abundant as epiphytes on the bark of the tree, taking an appearance of some *Bulbophyllum* species. The tepals are all semitranslucent and with a few longitudinal rosy purplish line, but petals are three times smaller than the petals, with the purple lip lacerate on both sides and two small obtuse lobes at the base.

Very floriferous species, flowering in October to November as far as we have observed at Nepal.

Considering both *Ione* (also spelled by Schlechter as *Jione*) and *Sunipia* as congeneric, Schlechter took up the former for this orchid ahead of *Sunipia* in his Orchideen, 337 (1915), but the latter name is an earlier legitimate generic name. In this concern, I would like to follow the view extended by Pfitzer that the two genera are separable owing to the structure of androecium.

Ione paleacea Lindley, Fol. Orch. 2 (1853)–Hook. f., Bot. Mag. t. 6344 (1878)–King et Pantl., Orch. Sikkim. 158, t. 215 (1898).

Bulbophyllum paleaceum Bentham, Gen. Pl. **3**: 503 (1883)–Fl. Brit. Ind. **5**: 769 (1890).

Kurseong, 1600 m (Apr. 12, 1960).

Distr. Temperate E. Himalaya (Sikkim, Bhutan).

The lip is attenuated to the apex, and there is no oblong thickened callus at all as stated by J. D. Hooker f. in Bot. Mag. t. 6344.

Liparis cordifolia Hooker f., Icon. Pl. t. 1811 (1889)–Fl. Brit. Ind. **5**: 692 (1890)–King et Pantl., Orch. Sikkim., 24, t. 28 (1898).

Taplethok–Helok, 1400–1500 m (Nov. 6, 1963).

Distr. Temperate Himalaya (North West to Sikkim), and Khasia.

Only one specimen with very young fruits was collected by Mr. Upadhyaya. Considering the vegetative features, I am sure that the plant belongs to this species.

Liparis platyrachis Hooker f., Icon. Pl. t. 1890 (1889)–Fl. Brit. Ind. **5**: 706 (1890)–King et Pantl., Orch. Sikkim. 34, t. 45 (1898).

Taplethok–Helok, 1400–1500 m (Nov. 6, 1963).

Distr. Temperate Himalaya (E. Nepal, Sikkim).

Our specimen was a little too late in the flowering season. King and Pantling states that the flowering season of this species is in September. The lip has obscure apicule, and the column in the anterior face on both sides is provided with semioblong plates ending in the small apicules.

Liparis resupinata Ridley in Journ. Linn. Soc. **22**: 290 (1886)–Hook. f., Icon. Pl. t. 1888 (1889)–Fl. Brit. Ind. **5**: 705 (1890)–King et Pantl., Orch. Sikkim. 36, t. 48 (1898).

Darjeeling, 2100 m (Apr. 10, 1960); Dentam, 1500 m (May 11, 1960); Bhuspate Danra–Mai Majuwa, 3100–1600 m (Dec. 3, 1963); Mai Majuwa–Dhara Pani, 1900–1500 m (Dec. 4, 1963).

Distr. E. Himalaya (Sikkim), and Assam.

The specimens collected by us in December were in full blossom. The side wings in the anterior side of column have one cirhira each pointing to the base of column. We have not collected var. *Ridleyi* King et Pantling, the larger flowered form.

Liparis Togashii Tuyama, sp. nov. [Pl. 22, Fig. 29 c–e]

Planta ambitu *Liparis pygmaea* affinis, sed bulbo 3-foliato, folio in sicco membranaceo, floris forma valde differt.

Planta epiphytica cum scapo ad 4.5–7.5 cm alta, pseudobulbo subaggregato breviter stipitato incrassato tereti oblongoideo ad 6–7 mm alto 4 mm crasso in sicco, in tempore florendi basi vaginis 2–3 ampulis subremote dispositis oblongo-orbicularibus apice longe acumintis recurvatis laxe amplectentibus, vulgo 3-foliato. Lamina folii erecta vel arcuata lineari-oblanceolata utrinque attenuata supra medium latissima apice acuta vel breviter acuminata in sicco menbranaceo-chartacea, ad 3.5 cm longa 2.5 mm lata. Scapus terminalis gracilis arcuato-patens, 6–16-florus, parte florifera 2–3 cm longa bractis floriferibus ovato-lanceolatis erecto-patentibus, ad 2.5 mm longis.

Pedicellus fructifer gracilis ad. 3 mm longus, fructus submaturus 2.5 mm longus et latus. Sepala toto similia ca. 2.2 mm longa lineari-oblonga apice valde obtusa toto evoluta, petala cum sepala aequilonga sed quintaplo angustiora. Labellum in explanato ovato-triangulare ca. 1.3 mm longum in latitudine leviter angustiore apice subacutum vel leviter cuspidatum et subincrassatum saltem longitudinaliter 5-nervatum, margine ad basin lateraliore involuto-erectum leviter incrassatumque, ad basin medio latelariter bicallosum. Fructus submaturus globosus ca. 2.5 mm longus latusque. Columna ad 1.7 mm longa anteriore in parte superiore lateraliter 2-alata.

Hati Sar–Minchin Dhap, 2700–2900 m (Oct. 28, 1963—Typus in TI); Minchin

Dhap-Mul Pokhari, 2900–2500 m (Oct. 29, 1963).

Distr. Endemica.

This may be a very rare orchid, and was discovered by us growing on the bark of tree a little high up from the ground intermixed with epiphytic liverworts. Regrettable for us is that the flowers were out of season, and only the floral remains were left on almost mature fruits. The descriptions given above are somewhat ambiguous especially concerning the lips. This rare orchid was dedicated to Mr. M. Togashi for his excellent collecting works. In fact without his works in our party, our collection might have not been like those as we have now in our hands.

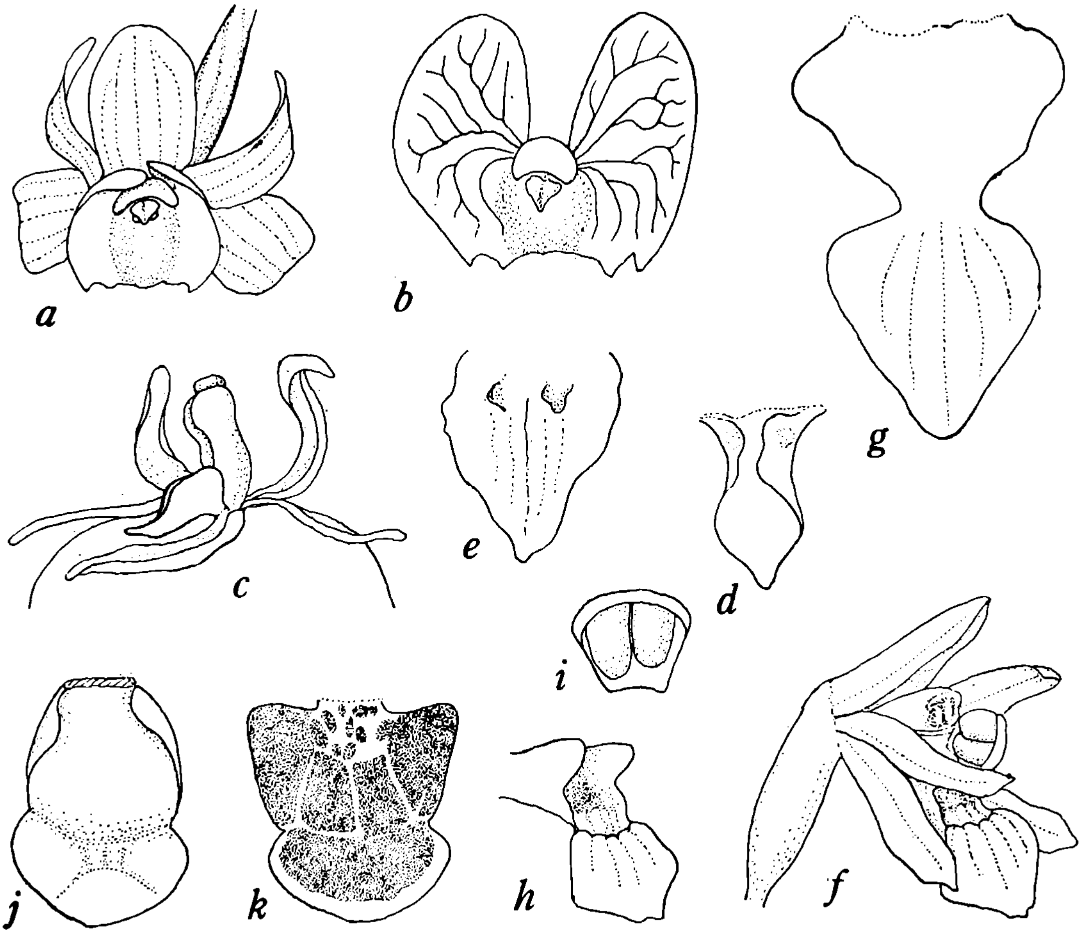

Fig. 29. a, b. *Malaxis tamurensis* Tuyama. a. A flower, × ca. 3. b. The lip and column, a little explanated, × ca. 6. c–e. *Liparis Togashii* Tuyama. c. An old flower on a premature fruit, × ca. 10. d. A lip, × ca. 16. e. A lip, explanated, × ca. 19. f–i. ?*Luisia teretifolia* Gaudich., from E. Nepal. f. A flower with anther sac and pollinia a little detached from the column, × ca. 4. g. A lip, explanated, × ca. 8. h. A lip, anterior lateral view, × ca. 4. i. Pollinia inbedded in anther sac, × ca. 8. (a–i, sketched from the boiled specimens). j, k. *Luisia teretifolia* Gaudich., from Isl. Rota, Mariana group, Micronesia. j. A lip × ca. 5. k. The same a little explanated, with maculations, represented by dotted area, × ca. 5. (j, k, sketched from the alcoholic specimen) (Del. T. Tuyama)

Liparis viridiflora (Blume) Lindley, Gen. Sp. Orch. 31 (Apr. 1830)–Holttum, Orch. Malay. 203 (1953)–Seidenf. et Smitin., Orch. Thail. 178, f. 145 (1959).

Malaxis viridiflora Blume, Bijdr. 392 (1825).

Liparis longipes Lindley in Wallich, Pl. Asia. Rar. **1**: 31, t. 35 (prob. Apr. 6, 1830)–Lindl., Gen. Sp. Orch. 30 (Apr.–Jun. 1830)–Fl. Brit. Ind. **5**: 703 (1890)–King et Pantl., Orch. Sikkim. 29, t. 37 (1898).

Tuwa–Taplethok, 1800–1400 m (Nov. 5, 1963); Helok, 1500 m (Nov. 8, 1963); Iladanda–Helok, 1800–1500 m (Nov. 13, 1963); Thakma Khola–Bhandukay, 3500–2500 m (Nov. 14, 1963); Ranga Pani–Ghorwa, 700–300 m (Dec. 9, 1963).

Distr. Tropical Himalaya (Kumaon to Bhutan), Khasia, Nilghiris, Ceylon, Thai, Malaysia, S. China (Kwangtung, Hong Kong), and Formosa.

? **Luisia teretifolia** Gaudichaud, Bot. Freyc. Voy. 427, t. 37 (1829)–Fl. Brit. Ind. **6**: 22 (1890)–King et Pantl., Orch. Sikkim., 202, t. 271 (1898)–Schlecht., Orch. Sino-Jap. 281 (1919), ut *L. teretifolia* Rolfe nec. Gaud. [Fig. 29 f–k]

Darjeeling, sine loco speciali (Feb. 28, 1963, florif. in Tokyo); Dentam-Pamianchi, 1900 m (May 12, 1960); Ratong Chu, 1000 m (May 15, 1960).

Distr. (of *Luisia teretifolia* in a broad sense). Subtropical Himalaya (Sikkim), Khasia, Bengal, Peninsular India, Ceylon, Burma, Thai, Indo-China, S. China, Malaysia, and New Caledonia.

The plant sent from Darjeeling in 1960 bore flower in Shinjuku Gyoen Garden. The flower was dark purplish. Demarcation of the species of *Luisia* is very difficult as mentioned by G. Seidenfaden and T. Smitinand in their Orch. Thailand **4**: 561 (1963). *Luisia teretifolia* Gaud. was first described based on the specimen believed to have been collected on the island of Guam, Marianas. I have previously studied the flower of *Luisia* from the island of Rota that is located very near to Guam in the Mariana group (On *Luisia teretifolia* Gaudichaud by Tuyama in Acta Phytotax. Geobot. **13**: 282–285 (1943). The Rota plant I took as to belong to the same taxon that was collected on Guam. As to the structure of the lip, Rota plant was quite different from the one so-called *Luisia teretifolia* from Himalayan region. In the Malaysian district, there are many related species like *Luisia javanica* J. J. Smith, *L. celebica* Schltr. and *L. confusa* Reichb. f. Further investigation is necessary to have definite concept of this species. See the illustration in figure.

O. Kuntze published his opinion in Rev. Gen. Pl. **2**: 672 that "*Luisia tristis* OK. (*Epidendrum triste* Forst.=*Luisia teretifolia* Gaudich.) Java: Willis." I have nothing to say on these, but both Forster and Gaudichaud's specimens might not be conspecific.

Malaxis acuminata D. Don, Prodr. Fl. Nepal. 29 (1825)–O. Kuntze, Rev. Gen. Pl. **2**: 673 (1891).

Microstylis Wallichii Lindley, Gen. Sp. Orch. 20 (1830)–Fl. Brit. Ind. **5**: 686 (1890)–King et Pantl., Orch. Sikkim. 15, t. 18 (1898).

Darjeeling, sine loco speciali (Jun. 21, 1960); Observatory Hill, Darjeeling, 2200 m (Jun. 26, 1960); Birch Hill, 2000 m (Jul. 18, 1960); Kalimpong (Jul. 19, 1960).

Distr. Temperate E. Himalaya (Sikkim), Khasia, and Ceylon.

f. **biloba** (Lindley) Tuyama, comb. nov.

Microstylis biloba Lindley, Gen. Sp. Orch. 20 (1830).

Microstylis Wallichii Lindley var. *biloba* Hooker f., Fl. Brit. Ind. **5**: 686 (1890)-King et Pantl., Orch. Sikkim. 16, t. 19 (1898).

Malaxis biloba (Lindley) Seidenfaden et Smitinand, Orch. Thail. 149 (1959).

Kathmandu 1400m (Sep. 1963; cult. in Tokyo Univ. pressed Jul. 23, 1964); Dhankuta, 1200 m (Oct. 1963, exact date of collection lost).

Distr. Nepal in the temperate zone, and Thai.

Pertaining to the form of the lip of var *biloba*, Lindley only states as 'labello ovato: sinu aperto', but later Hooker, f. and King et Pantling added many other diagnostic characters both floral and vegetative part as distinctive to this plant. However, these are very variable and can not be hold. I have here only taken up bilobed nature of the labellar tip to characterize f. *biloba.*

Malaxis latifolia Smith in Rees, Cyclop. **22**: no. 3 (1812)-Holttum, Orch. Malay. 193 (1953)-Seidenf. et Smitin., Orch. Thail. 146, f. 112.

Dienia congesta Lindley, Bot. Reg. sub t. 825 (1827).

Microstylis congesta (Lindl.) Reichenbach f. in Walpers, Ann. **6**: 206 (1861)-Fl. Brit. Ind. **5**: 689 (1890)-King et Pantl., Orch. Sikkim. 19, t. 23 (1898).

Microstylis latifolia (Smith) J. J. Smith, Fl. Jav. **6**: 248 (1905)-Schlecht., Orch. Sino-Jap. 191 (1919).

Dhankuta, 1200 m (Oct. 18, 1963); Mul Pokhari–Dumhan (Oct. 30, 1963); Tuwa-Taplethok, 1800–1400 m (Nov. 5, 1963); Tharpu, 1200 m (Nov. 26, 1963).

Distr. Tropical Himalaya (E. Nepal, Sikkim), Khasia, Deccan, Ceylon, Andaman Is., Thai, Malaya, and S. China (Hong Kong, Formosa).

King and Pantling stated that 'There are . . . two transverse calli on the lip, —one at the base just beneath the column, and the other connecting the two lateral lobes of the apex.' In our specimen, however, only the anterior margins of the lateral lobes are thickened, and these thickened parts are not connected transversally. The flower is pale yellow green or pale purplish, and individually has one definite color. The tubers at the base of the stems are very stout, sometimes attaining to 3 cm or more in diameter. As to Seidenfaden and Smitinand's figures of this plant, it seems somewhat different in the vegetative features and especially in the nature of column. Further study is necessary.

Malaxis muscifera (Lindley) O. Kuntze, Rev. Gen. Pl. **2**: 673 (1891).

Dienia muscifera Lindley, Gen. Sp. Orch. 23 (1830).

Microstylis muscifera (Lindley) Ridley in Journ. Linn. Soc. **24**: 333 (1888)-Fl. Brit. Ind. **5**: 689 (1890)-King et Pantl., Orch. Sikkim. 20, t. 25 (1898).

Bilbatay Bhanjang–Hati Sar, 2200–2900 m (Oct. 27, 1963); Minchin Dhap-Mul Pokhari, 2900–2500 m (Oct. 29, 1963); Birwa–Yektin, 2900–1600 m (Nov. 28, 1963); Bhuspate Danra–Mai Majuwa, 3100–1600 m (Dec. 3, 1963); Tonglu, 3000 m (Sep. 16, 1964).

Distr. Afghanistan, and temperate Himalaya (Garhwal to Bhutan).

The specimen collected at Tonglu on Sep. 16th was also a little late in flowering season, but I am sure that it belongs to the species. Bearing two rather smaller leaves, the base of the stem is thickly bulbous, and the inflorescence is erect and densely flowered.

Malaxis tamurensis Tuyama, sp. nov. [Fig. 29 a, b]

Planta ad ca. 50 cm alta basi bulbosa et bifoliata, basi cataphyllis ad 9cm longa et 1.1 cm lata praedita, foliis anguste lanceolatis apice subito acuminatis basi subrotundatis et subito contractis scapo amplectantibus, nerviis prominulis 7, praeter marginibus 1–2 nervulis subpromulibus additis, in sicco tenuiter membranaceis. Scapus stricte erectus ad 50 cm altus ad basin 3 mm crassus, supra medium sparcissime bracteis parvioribus conspersis, bracteis floriferis subulatis 1-nervatis, integris sub et post anthesin deflexis ad 8 mm longis 0.7 mm latis, floribus congestis ca. 8.0 mm diametro, colore ignoto, pedicellis cum ovariis ca. 6 mm longis gracilibus. Flos cum petalis arcuato-deflexis, sepalis leviter deflexis, petalis toto similibus oblongis vel anguste oblongis apice rotundatis obscure 5-nervatis 5.5 mm longis 3.0 mm latis, petalis valde angustioribus apice subacutis obscure 1-nervatis 5.3 mm longis et 2.7 mm latis. Labellum ambitu rotundato-quadrangulare, apice truncatum et subirregulariter parce lateque dentatum cum lobis superioribus late inaequaliter late oblongis apice rotundatis, nervis inferioribus decurvatis multo ramosis praeditis, labello toto 5 mm longo 6 mm lato apice in medio incrassato, colmna brevissima non appendiculata. Fructus ignotus.

Dhankuta, 1200 m (Oct. 18–22, 1963 ; cult. in Univ. Tokyo, florif. 19, Aug. 1964—Typus in TI).

Distr. Endemica.

The specific epithet is based on the name of the Tamur river, a tributary of the River Sapt Kosi flowing into the Great Ganges, at which basin drainage of our second expedition to Himalayan region was mainly performed. This was sent to Tokyo alive, and flowered in the greenhouse of University of Tokyo.

Nervilia macroglossa (Hooker f.) Schlechter in Engl., Bot. Jahrb. **45**: 402 (1911).

Pogonia macroglossa Hooker f., Fl. Brit. Ind. **6**: 120 (1890); Icon. Pl. t. 2195 A (18-94)–King et Pantl., Orch. Sikkim. 267, t. 356 (1898).

Dentam–Pamianchi, 1500–2000 m (May 12, 1960).

Distr. Subtropical Himalaya (Sikkim).

This was collected only at one spot under sparse forest. The lip is pinkish at the tip and the other parts pale yellowish green or white, the margin being irregularily undululate or undulate.

Oberonia falcata King et Pantling in Journ. Asia. Soc. Beng. **64** (2): 329 (1895); Orch. Sikkim. 12, t. 14 (1898).

Darjeeling, 2100 m (Apr. 10, 1960); Tharpu–Khunga Chuli, 2300–1200 m (Nov. 27, 1963); Bhuspate Danra–Mai Majuwa, 3100–1600 m (Dec. 3, 1963); Penlong La, 2100 m (May 18, 1963).

Distr. Himalaya (E. Nepal, Sikkim).

The original specimen was collected by Pantling at Choongthang in Sikkim Valley at the elevation of 6000 ft. The specimen collected by Prof. Hara at Penlong La at 2100 m was cultivated in the greenhouse of University of Tokyo. It flowered in July, 1964 and the flower was greenish as a whole, the lip bifid and brownish.

Oberonia iridifolia (Roxburgh) Lindley, Gen. Sp. Orch. 15 (1830)–Fl. Brit. Ind. **5**: 675 (1888)–King et Pantl., Orch. Sikkim. 8, t. 8 (1898)–Holttum, Orch. Malay. 215 (1953)–Seidenf. et Smitin., Orch. Thail. 160 (1959).

Cymbidium iridifolium Roxburgh [Hort. Beng. 63 (1814), nom. nud.] Fl. Ind. ed. 2, **3**: 458 (1832).

Malaxis iridifolia (Roxburgh) Reichenbach f. in Walpers, Ann. **6**: 208 (1861).

Tuwa–Taplethok, 1800–1400 m (Nov. 5, 1963).

Distr. (incl. var.) Subtropical E. Himalaya (E. Nepal to Bhutan), Assam, Burma, Andaman Isl., and ?China (?Hainan).

It is said that only the typical form is distributed in Sikkim, of this variable and widely distributed species. The lip is indistinctly 3-lobed, and pectinate or erose somewhat irregularly.

Oberonia myriantha Lindley, Fol. Orch. 4 (1859)–Fl. Brit. Ind. **5**: 679 (1888)–King et Pantl., Orch. Sikkim. 10, t. 12 (1898).

Garhi Danra–Tuwa, 2200–1800 m (Nov. 4, 1963); Tuwa–Taplethok, 1800–1400 m (Nov. 5, 1963); Taplethok–Helok, 1400–1500m (Nov. 6, 1963); Tharpu–Chyangthaphu, 1200–1300 m (Nov. 26, 1963).

Distr. E. Himalaya (Sikkim), Khasia, and Naga Hills.

The petals seem a little wider than those of the figures published by King and Pantling, and subacute and not truncate at the apex.

Oberonia pachyrachis Reichenbach f. ex Hooker f., Fl. Brit. Ind. **5**: 681 (1890)–King et Pantl., Orch. Sikkim. 4, t. 3 (1898).

Taplethok–Helok, 1400–1500 m (Nov. 6, 1963).

Distr. Tropical Himalaya (Garhwal to Sikkim), and Khasia.

Characteristic of its very thick cylindric scape, and the flowers which are densely disposed half imbedded on it. The plant is fairly variable in size, for example the scape ranging between 3–10 cm in length, and 3–7 mm in thickness.

Oreorchis foliosa (Lindley) Lindley in Journ. Linn. Soc. **3**: 27 (1859)–Royle, Ill. Bot. Himal. 362 (1839)–Fl. Brit. Ind. **5**: 709 (1890)–King et Pantl., Orch. Sikkim. 183, t. 137 (1898)–Schlecht., Orch. Sino-Jap. 223 (1919).

Corallorhiza foliosa Lindley, Gen. Sp. Orch. 535 (1840).

Phalut–Sandakphu, 3500 m (Jun. 6, 1966).

Distr. Temperate Himalaya (Simla to Sikkim), Tibet, and China (Szechuan).

The lip of our collection has the mid-lobe more slightly incised at the middle, and the side-lobes much more shorter.

Oreorchis micrantha Lindley in Journ. Linn. Soc. **3**: 27 (1859)–Fl. Brit. Ind. **5**: 709 (1890)–King et Pantl., Orch. Sikkim. 183, t. 138 (1898).

Sandakphu–Tonglu, 3000 m (Jun. 7, 1960).

Distr. Temperate Himalaya (Kumaon to Sikkim), and China (Szechuan).

Only the remains of the flower were found on our specimen. Mainly from the vegetative features, I have identified it with this species.

Ornithochilus difformis (Wallich) Schlechter, Orch. Sino-Jap. 277 (1919), in nota.

Aerides difforme Wallich ex Lindley, Gen. Sp. Orch. 242 (1833).

Ornithochilus fuscus Wallich ex Lindley, Gen. Sp. Orch. 242 (1833), pro syn.–Fl. Brit. Ind. **6**: 76 (1890)–King et Pantl., Orch. Sikkim. 200, t. 268 (1898)–Seidenf. et Smitin., Orch. Thail. 545, f. 405 (1963).

Tuwa–Taplethok, 1800–1400 m (Nov. 5, 1963); Ghatte–Khebang, 1600–2400 m (Nov. 17, 1963).

Distr. Tropical Himalaya (Garhwal to Sikkim), Bhutan, Khasia, Burma, Thai, and Indo-China.

The genus is very characteristic of its peculiarly formed lip. In this species there is a conspicuous longitudinal callus on the mesochile of the lip.

Otochilus fusca Lindley, Gen. Sp. Orch. 35 (1830)-Fl. Brit. Ind. **5**: 844 (1890)-King et Pantl., Orch. Sikkim. 143, t. 199 (1898).

Garhi Danra-Tuwa, 2200-1800 m (Nov. 4, 1963); Ghatte-Khebang, 1600-2400 m (Nov. 19, 1963); Yektin, 1100 m (Nov. 29, 1963).

Distr. Subtropical Himalaya (Nepal, Sikkim), Assam, and Khasia.

Otochilus porrecta Lindley, Gen. Sp. Orch. 36 (1830)-Fl. Brit. Ind. **5**: 844 (1890)-King et Pantl., Orch. Sikkim. 142, t. 198 (1898)-Seidenf. et Smitin., Orch. Thail. 145, f. 110 (1959).

Victoria Fall, Darjeeling, 1900 m (Apr. 3, 1960).

Distr. Sikkim Himalaya.

Panisea parviflora Lindley, Fol. Orch. 1 (1854)-Fl. Brit. Ind. **5**: 783 (1890)-Hook. f. in Ann. Bot. Gard. Calcut. **5**: 19, t. 29 (1895)-King et Pantl., Orch. Sikkim. 142, t. 197 (1898).

Coelogyne parviflora Lindley, Gen. Sp. Orch. 44 (1830).

Near Mai Pokhari, 1600 m (Dec. 4, 1963).

Distr. Subtropical Himalaya (Nepal, Sikkim), and Khasia.

Only one individual was found in the area we have botanized. The flowers are delicately formed and somewhat ephemeral. The floral envelopes are white tinged slightly orange-rose at the tip.

Phalaenopsis decumbens (Griffith) Holttum in Gard. Bull. Sing. **11**: 286 (1947); Orch. Malay. ed. 3, 669 (1964)-Seidenf. et Smitin., Orch. Thail. 544, f. 404, t. 23, f. 1100 (1963).

Aerides decumbens Griffith, Notul. **3**: 365 (1851); Icon. Pl. Asia. t. 320 (1851).

Phalaenopsis Wightii Reichenbach f. in Bot. Zeit. **20**: 214 (1862).

Aerides latifolium Thwaites, Enum. Pl. Zeyl. 429 (1864).

Doritis Wightii Bentham in Bentham et Hooker f., Gen. Pl. **3**: 574 (1883)-Fl. Britt. Ind. **6**: 32 (1890)-King et Pantl., Orch. Sikkim. 198, t. 265 (1898).

Dorites latifolia (Thwaites) Bentham, l.c. (1883)-Schlecht., Orch. Sino-Jap. 276 (1919).

Kingiella decumbens (Griffith) Rolfe in Orch. Rev. **25**: 196 (1917).

Ranga Pani-Ghorwa, 700-300 m (Dec. 9, 1963); Ghorwa-Sanichare, 300-200 m (Dec. 10, 1963).

Distr. Subtropical Himalaya (Sikkim to Bhutan), Peninsular India, Ceylon, Burma, Malay, Malay Archipelago, and S. China (Hainan).

The flowers of our specimen were too old, so that the determination was mainly based on the fruits and the vegetative characters.

Pholidota imbricata (Roxburgh) Lindley in Hooker f., Exot. Fl. **2**: t. 138 (1825)-Schlecht., Orch. Sino-Jap. 188 (1919)-Holttum, Orch. Malay. 234 (1953).

Cymbidium imbricatum Roxburgh [Hort. Beng. 63 (1814), nom. nud.] Fl. Ind. ed. 2, **3**: 460 (1832).

Darjeeling, 2000 m (Apr. 10, 1960); Gangtok, 1000 m (Jun. 16, 1960); Garhi

Danra–Tuwa, 2200–1800 m (Nov. 4, 1960); Tuwa–Taplethok, 1800–1400 m (Nov. 5, 1963); Khebang–Siling Tzokupa, 1700–2100 m (Nov. 20, 1963).

Distr. (in the wide sense) Tropical Himalaya (Kumaon to Sikkim), Khasia, Peninsular India, Ceylon, Burma, Andaman Isl., Malaya, China (Yunnan), Malay Archipelago to Australia.

Pholidota protracta Hooker f., Icon. Pl. t. 1877 (1889)–Fl. Brit. Ind. **5**: 845 (1890)–King et Pantl., Orch. Sikkim. 146, t. 203 (1898).

Mani Bhanjang–Batasi, 2000–2100 m (May 1, 1960); Dentam–Pamianchi, 1500–2000 m (May 12, 1960); Mai Majuwa–Dhara Pani, 1900–1500 m (Dec. 5, 1963); Ranga Pani–Ghorwa, 700–300 m (Dec. 9, 1963).

Distr. Sikkim, Khasia, and Naga Hills.

This grows in great abundance from place to place. The lip has the manifest concave marking at its base and has not definite trilobation in some instances, different from that illustrated in Hooker's Icones.

Platanthera Backeriana (King et Pantling) Kränzlin, Gen. Sp. Orch. 633 (1898)–Schlecht., Orch. Sino-Jap. 108 (1919).

Habenaria Backeriana King et Pantling in Journ. Asia. Soc. Beng. **65** (2): 132 (1895); Orch. Sikkim. 314, t. 413 (1898).

Minchin Dhap–Mul Pokhari, 2900–2500 m (Oct. 29, 1963).

Distr. Temperate Himalaya (E. Nepal, Sikkim), and China (Kweichow, Yunnan).

Very rare? We have got only two plants. The flowers were a little over, and probably, by confusion with the other similar species, the plants might have escaped our notice. The floral bract is lanceolate with the blunt tip, nerves 5 in number, outer nerves converging with the inner ones or the midrib at their terminals. The sepals and petals are all thickly one-nerved, but in some cases with additional very vague lateral veinlets. The lip is fleshy linear-oblong, somewhat dilated towards the base, and has a collar at the entrance of the spur.

Pleione Hookeriana (Lindley) O. Kuntze, Rev. Gen. Pl. **2**: 680 (1891).

Coelogyne Hookeriana Lindley, Fol. Orch. 14 (1854)–Bot. Mag. t. 6388 (1878)–Fl. Brit. Ind. **5**: 842 (1890)–King et Pantl., Orch. Sikkim. 139, t. 193 (1898).

Near Chia Bhanjang, 3200m (Jun. 2, 1960, no. 736); Kala Pokhari, 3000m (Jun. 7, 1960, no. 694); Hati Sar–Minchin Dhap, 2700–2900 m (Oct. 28, 1963); Minchin Dhap–Mul Pokhari, 2900–2500 m (Oct. 27, 1963); Bhandukay–Ghatte, 2500–1600 m (Nov. 16, 1963); Baroya Khimty–Thakma Khola, 2500–3200 m (Nov. 16, 1963).

Distr. Temperate E. Himalaya (E. Nepal, Sikkim).

Fairy abundant on mossy trunks of trees, or sometimes on mossy rocks at high altitude..

Pleione humilis (Smith) D. Don, Prodr. Fl. Nepal. 37 (1825). [Pl. 7 b]

Epidendrum humile Smith, Exot. Bot. **2**: 75, t. 98 (1804–07).

Cymbidium humile Smith in Rees, Cyclop. 10 (1809).

Coelogyne humilis (Smith) Lindley, Coll. Bot. 37 (1821); Gen. Sp. Orch. 43 (1830)–Fl. Brit. Ind. **5**: 840 (1890)–King et Pantl., Orch. Sikkim. 139, t. 194 (1898).

Tendong Peak, 2900 m (May 26, 1963, fl.).

Distr. Temperate Himalaya (Nepal, Sikkim).

Of the specimens collected by Prof. Hara at Tendong Peak, and sent to Tokyo, the one flowered in the greenhouse of University of Tokyo, as shown in Color Plate 7 b. This kind was reported by King and Pantling to be called by the European residents of Darjeeling as "Himalayan Crocus." At present this became rather rare around the city.

Pleione praecox (Smith) D. Don, Prodr. Fl. Nepal. 37 (1825)–Schlecht., Orch. Sino-Jap. 187 (1919)–Seidenf. et Smitin., Orch. Thail. 132 (1959).

Epidendrum praecox Smith, Exot. Bot. **2**: t. 97 (1804–07).

Coelogyne praecox (Smith) Lindley, Coll. Bot. 37 (1821); Fol. Orch. (1853)–Fl. Brit. Ind. **5**: 840 (1890)–King et Pantl., Orch. Sikkim. 141, t. 196 (1898).

Happy Valley, Darjeeling, 1900 m (Apr. 9, 1960); Dentam–Pamianchi, 1900 m (May 12, 1960); Bilbatay Bhanjang, 2200 m (Oct. 26 et 27, 1963); Mul Pokhari–Dumhan, 2500–2000 m (Oct. 30, 1963); Ghatte–Khebang, 1600–2400 m (Nov. 19, 1963); Siling Tzokupa (Nov. 21, 1963); Birwa–Yektin, 2900–2000 m (Nov. 28, 1963); Tharpu–Khunga Chuli, 2300–2000 m (Nov. 27, 1963); Mai Majuwa–Dhara Pani, 1600–1900 m (Dec. 4, 1963).

Distr. Temperate Himalaya (Garhwal to Sikkim), Khasia, N. Burma, Thai, and China (Yunnan).

Flowering period is from late October to the beginning of November. Epiphytic on the mossy trunks, but not so high up as often seen in the case of *Pleione Hookeriana*.

Porpax Meirax (Parish et Reichenbach f.) King et Pantling, Orch. Sikkim. 114, t. 158 (1898)–Holttum, Orch. Malay. 393 (1953)–Seidenf. et Smitin., Orch. Thail. 314, f. 236 (1960).

Cryptochilus Meirax Parish et Reichenbach f. in Trans. Linn. Soc. **30**: 148 (1874).

Eria Meirax (Parish et Reichenbach f.) N. E. Brown in Gard. Chron. **1880** (1): 603 (1880).

Sanguri Bhanjang (Oct. 16, 1963); Taplejung, 1700 m (Nov. 2, 1963); Taplethok–Helok, 1400–1500 m (Nov. 6, 1963); Mai Majuwa–Dhara Pani, 1900–1500 m (Dec. 4, 1963).

Distr. Subtropical Himalaya (Sikkim), Lower Burma, Thai, and Malaya.

Our specimens that were collected in October to November were in flowers. In the exposed places, however, the plants have already been in young fruits.

Rhynchostylis retusa Blume, Bijdr. 286, t. 49 (1825)–Fl. Brit. Ind. **6**: 32 (1890) –King et Pantl., Orch. Sikkim., 213 t. 284 (1898)–Holttum, Orch. Malay. 697 (1953)–Seidenf. et Smitin., Orch. Thail. 555, f. 413, t. 24-f. 552 (1963)–Spring Fl. Sikkim Himal. 127, f. 192–193 (1963).

Gangtok–Saramsa Medicinal Garden, 1000 m (Jul. 17, 1960); Yektin, 1100 m (Nov. 29, 1963); Illam–Ranga Pani, 1200–400 m (Dec. 8, 1963); Ranga Pani–Ghorwa, 700–300 m (Dec. 9, 1963); Ghorwa–Sanichare, 300–200 m (Dec. 12, 1963).

Distr. Tropical Himalaya (Garhwal to Assam), Bengal, Ceylon, Lower Burma, Thai, Indo-China, Malay, and Malay Archipelago.

Only the specimens from near Gangtok were in flower.

Sarcanthus filiformis Lindley in Bot. Reg. **1842**: Misc. 61 (1842)–Bot. Mag. t. 4639 (1852)–Fl. Brit. Ind. **6**: 66 (1890)–King et Pantl., Orch. Sikkim. 240, t. 319 (1898)–Hawkes, Encycl. Cult. Orch. 424 (1965). [Pl. 7 a]

Tharpu–Chyangthaphu, 1200–1300 m (Nov. 26, 1963).

Distr. Tropical Himalaya (E. Nepal, Sikkim), Khasia, Lower Burma, Thai, and Vietnam.

We have collected this one with almost ripe fruits only at one spot, long hanging from the trunk of a tree. One plant was safely sent to Japan, and bore flowers at the greenhouse of Koishikawa Botanic Garden of University of Tokyo. Sepals and petals are intensely brown-purplish; sac of the lip subbilobed at the apex, pale rose with longitudinal deeper rose-colored stripes several in number becoming paler towards the tip; midlobe of the lip parallel to the column or diversing and recurving to the pointed tip, bright rose but whitish at the pointed apex; sidelobes whitish tinged with yellow upwards; column colored paler rosy purple with the nuance of brown. Flowering in March in Tokyo.

Satyrium nepalense D. Don, Prodr. Fl. Nepal. 26 (1825)–Fl. Brit. Ind. **6**: 168 (1890)–King et Pantl., Orch. Sikkim. 338, t. 444 (1898).

Kakani Hill, 2100–2200 m (Sep. 24, 1963); Dhankuta–Sindwa, 1200–2100 m (Oct. 22, 1963); Dhankuta–Murhay, 1200–2100 m (Oct. 23, 1963); Murhay, 2100 m (Oct. 24, 1963); Bilbatay Bhanjang–Hati Sar, 2200–2900 m (Oct. 27, 1963); Hati Sar–Minchin Dhap, 2700–2900 m (Oct. 28, 1963); Minchin Dhap–Mul Pokhari, 2900–2500 m (Oct. 29, 1963); Selap–Walunchung Ghola, 2600–3800 m (Nov. 10, 1963); Helok–Baroya Khimty, 1500–2500 m (Nov. 10 et 15, 1963); Baroya Khimty, 2500 m (Nov. 11, 1963); Baroya Khimty–Thakma Khola, 2500–3200 m (Nov. 12, 1963); Siling Tzokupa, 2100–3100 m (Nov. 21, 1963); Lagyap, 2200 m (Sep. 13, 1964); Kala Pokhari–Sandakphu, 3000–3500 m (Sep. 16, 1964).

f. **albiflorum** Tuyama, f. nov.—Flores albi (fide H. Hara).

Darjeeling, 2150 m (Sep. 15, 1964).

Distr. Temperate Himalaya (Kashmir to Sikkim), Khasia, Peninsular India, Ceylon, N. Burma, and China (Yunnan).

Specimens with very short spurs as described by J. D. Hooker and Lindley (var. *Wightiana* Hook. f., Fl. Brit. Ind. **6**: 168 (1890), etc. –*Satyrium Wightianum* etc. Gen. Sp. Orch. 340 (1838)) were rarely found by us. As there are intermediate forms between the typical ones, it is difficult to separate those as distinct varieties.

Schlechter, in my mind, has the tendency to split so much, that I am suspicious that among the several species he has described from Yunnan like *S. Henryi*, *S. Mairei*, *S. yunnanense*, we shall be able to find the plants belonging to *S. nepalense* itself, if we could examine his specimens.

Schoenorchis gemmata (Lindley) J. J. Smith in Nat. Tijdschr. Ned. Ind. **72**: 100 (1912)–Seidenf. et Smitin., Orch. Thail. **4**: 613, f. 461 (1963).

Saccolabium gemmatum Lindley in Bot. Reg. Misc. 50 (1838).

Saccolabium geminatum (non *gemmatum*) Lindley ex Hooker f., Fl. Brit. Ind. **6**: 55 (1890).

Cleisostoma gemmatum (Lindley) King et Pantl., Orch. Sikkim. 235, t. 313 (1898).

Ratong Chu–Tingling Bridge, 1000 m (May 16, 1960); Gangtok, 1000 m (Jun. 17, 1960); Tuwa–Taplethok, 1800–1400 m (Nov. 5, 1963).

Distr. Subtropical E. Himalaya (E. Nepal to Bhutan), Khasia, Peninsular India, Thai, and Indo-China.

Flowering period May to June. Epiphyte on the trees in the xerophytic condition. This stands very near to *S. hainanense* (Rolfe) Schlechter of Hainan.

Spiranthes sinensis (Persoon) Ames, Orch. **2**: 53(1908)-Schlecht., Orch. Sino-Jap. 160 (1919)-Kitamura in Faun. & Fl. Nepal Himal. 104 (1955); in Act. Phytotax. Geobot. **21**: 23 (1964).

Neottia sinensis Persoon, Syn. Pl. **2**: 511 (1807).

subsp. **australis** (R. Brown) Kitamura in Act. Phytotax. Geobot. **21**: 23 (1964).

Neottia australis R. Brown, Prodr. Fl. Nov. Holl. 319 (1810)-D. Don, Prodr. Fl. Nepal. 27 (1825).

Spiranthes australis (R. Brown) Lindley, Bot. Reg. t. 823 (1824)-Gen. Sp. Orch. 464 (1840)-Fl. Brit. Ind. **6**: 102 (1890)-King et Pantl., Orch. Sikkim. 278, t. 369 (1898).

Kurseong, 1600 m (Apr. 2, & 12, 1960); Kakani, 2100-2200 m (Sep. 24, 1963); Dhankuta-Sinduwa, 1200-2100 m (Oct. 22, 1963); Sinduwa, 2100 m (Oct. 24, 1963); Bilbatay Bhanjang-Hati Sar, 2200-2900 m (Oct. 27, 1963); Minchin Dhap-Mul Pokhari, 2900-2500 m (Oct. 29, 1963); Baroya Khimty, 2400 m (Nov. 29, 1963); Bhandukay, 2500 m (Nov. 14, 1963); Senchal, 2400 m (Sep. 19, 1964).

Distr. Afghanistan, temperate and subtropical Himalaya (Nepal to Bhutan), India as a whole, S. E. Asia, Malay Archipelago, Australia, New Zealand, China, Korea, Japan, Mongolia, Siberia, and Saghalin.

Prof. Kitamura (1964) separated this subspecies from the mother species by the latter as being glabrous on its inflorescence and ovary. This form as he defined occurs in S. China including Hainan and Formosa and in S. Japan. All the specimen we have collected from Himalaya were puberulous plants. Specimens in the Herbarium of University of Tokyo collected by Major F. E. Younghusband (Herbarium Tibet Frontier Commission Sep. 1903) were all puberulous on the spikes and ovaries, in agreement with Prof. Kitamura's view point. Our specimens from Happy Valley, Darjeeling, 1900 m (Apr. 25, 1960) were white-flowered.

Thrixspermum pygmaeum (King et Pantling) Holttum in Kew Bull. **14**: 275 (1960)-Spring Fl. Sikkim Himal. 127, f. 191 (1963).

Sarcochilus pygmaeus King et Pantling, Orch. Sikkim. 207, t. 277 (1898).

Chia Bhanjang-Dentam, rather near Dentam, 2000 m, on the bark of *Mahonia* sp. (May 11, 1960).

Distr. Subtropical Himalaya (Sikkim), endemic.

This was originally described based on the specimen collected by Pantling near Pamianchi, Sikkim. As we have only met with this plants at one place as in the case of Pantling, this may presumably be a very rare plant of Sikkim. King and Pantling state that the scape is 3-4-flowered, but in our specimens 5-7-flowered. As the flowers are ephemeral, it was a great lucky for us to have collected them in full blossom. The lip is a little saccate, and near its base in the middle there is a small callus covered with dense papillae as described by King and Pantling.

Thunia alba (Lindley) Reichenbach f. in Bot. Zeit. **1852**: 764 (1852)-Holttum, Orch. Malay. 183, f. 31 (1953)-Seidenf. et Smitin., Orch. Thail. 184 & 770 (1959).

Phajus albus Lindley, Gen. Sp. Orch. 128 (1831)-Bot. Mag. t. 3991 (1843).

Kurseong, 1600 m (Apr. 12, 1960); Khebang-Siling Tzokupa, 1700-2100 m (Nov. 20, 1963); Ranga Pani-Ghorwa, 700-300 m (Dec. 9, 1963).

Distr. Tropical Himalaya (Garhwal to Sikkim), Khasia, and Burma.

Found among fairly exposed rocks. The lip has about seven copiously crested nerves running longitudinally in the middle part, with veinlets a little anastomosing on the outer side.

Tipularia Josephii Reichenbach f. ex Lindley in Journ. Linn. Soc. **1**: 174 (1857)–Fl. Brit. Ind. **5**: 708 (1890)–King et Pantl., Orch. Sikkim. 151, t. 207 (1898)–Schlecht., Orch. Sino-Jap. 226 (1919), in nota.

Bilbatay Bhanjang–Hati Sar, 2200–2900 m (Oct. 27, 1963); Hati Sar–Minchin Dhap, 2700–2900 m (Oct. 28, 1963); Minchin Dhap–Mul Pokhari, 2900–2500 m (Oct. 29, 1963).

Distr. Temperate Himalaya (Sikkim).

Our specimens were a little too late in the flowering season, but the boiled flower showed 3-nerved sepal, 1-nerved petal, and the lip with 4-nerved midlobe and the side-lobes 1-nerved with soemwhat obscured calli on each. This is very near to *T. japonica* Matsumura of Japan. However, the flowers of our Himalayan plants are too poor to bring to a definite conclusion.

Vanda alpina Lindley, Fol. Orch. 10 (1853)–Fl. Brit. Ind. **6**: 53 (1890)–King et Pantl., Orch. Sikkim. 217, t. 289 (1898).

Luisia alpina Lindley in Bot. Reg. **1858**: Misc. 56 (1858).

In the vicinity of Gangtok, ca. 1000 m (Apr. 25, 1960).

Distr. Subtropical Himalaya (Garhwal to Bhutan), and Khasia.

Vanda undulata Lindley in Journ. Linn. Soc. **3**: 42 (1859).

Stauropsis undulata Bentham ex Hooker f., Fl. Brit. Ind. **6**: 27 (1890)–King et Pantl., Orch. Sikkim. 205, t. 257 (1898)–Spring Fl. Sikkim Himal. 127, f. 195 1963).

Darjeeling, Happy Valley, 1900 m (Apr. 10, 1960); Rimbick, 200 m (May 7, 1960); Chia Bhanjang–Dentam, 2000–1500 m (May 11, 1960); Ghatte–Khebang (Nov. 19, 1963); Yamphodin–Ghatte, 2100–1600 m (Nov. 18, 1963); Tharpu–Khunga Chuli, 1200–2300 m (Nov. 27, 1963); Mai Majuwa–Dhara Pani, 1500–1900 m (Dec. 4, 1963).

Distr. Subtropical E. Himalaya (E. Nepal to Bhutan), and Khasia.

Some of the plants sent to Tokyo were grown to flower. The general feature of the flower was quite the same as figured by King and Pantling, but paler than that. The tip of the lip was pale yellow, the anther sac purplish, the tip of the dorsal sepal yellowish, otherwise were all whitish.

Zeuxine flava (Lindl.) Bentham [in Bentham et Hooker f., Gen. Pl. **3**: 600 (1883)] ex Hooker f., Fl. Brit. Ind. **6**: 108 (1890)–King et Pantl., Orch. Sikkim. 289, t. 286 (1898).

Monochilus flavum Wallich ex Lindley, Gen. Sp. Orch. 487 (1840); in Journ. Linn. Soc. **1**: 187 (1857).

Dentam–Pamianchi, 1500–2000 m (May 12, 1960).

Distr. Subtropical Himalaya (Nepal to Assam), Naga Hills, Ceylon, Lower Burma, Java, and Borneo.

As the flowers were in bad condition, this identification implies a little doubt. The stem, bracts, and ovaries are covered sparsely with thick hairs of several cell-layers.

PTERIDOPHYTA

The families are arranged in Copeland's system (Genera Filicum 1947) for convenience sake. The fern-allies are in the course of study by Dr. Motozi Tagawa, and are not included in this report.

OPHIOGLOSSACEAE (by Makoto Nishida)

Helminthostachys zeylanica (L.) Hooker, Gen. Fil. 47 (1842)–Beddome, Ferns South India 23, pl. 69 (1863); Handb. Ferns Brit. India 476 (1883)–Holttum, Fl. Malaya **2**: 40 (1954)–Clausen in Mem. Torrey Bot. Cl. **19**: 108 (1938).

Osmunda zeylanica L., Sp. Pl. ed. 1, **2**: 1063 (1753).

Sibganja–Mahara Bahara, 200 m (Dec. 12, 1963); Mahara Bahara–Kathgara, 200 m (Dec. 13, 1963); Rangali–Biratnagar, 200 m (Dec. 15, 1963).

Distr. E. Himalaya, Assam, Ceylon, S. China, Japan (Ryukyu), New Caledonia, Malaysia, and Australia.

Japonobotrychium lanuginosum (Wallich) Nishida ex Tagawa in Journ. Jap. Bot. **33**: 199 (1958).

var. **lanuginosum.**

Botrychium lanuginosum Wallich ex Hooker & Greville, Icon. Fil. **1**: 79 (1829)–Clausen in Mem. Torrey Bot. Cl. **19**: 96 (1938).

B. virginicum (L.) Swartz *β. lanuginosum* (Wall.) Moore, Index Filic. 213 (1861).

B. virginianum β. lanuginosum (Wall.) Beddome, Suppl. Ferns Brit. India 28 (1876); Handb. Ferns Brit. India 471 (1883); Suppl. Ferns Brit. India 110 (1892).

B. lanuginosum Wallich var. *typicum* Clausen in Mem. Torrey Bot. Cl. **19**: 96 96 (1938).

Yoksam–Bakkim, 1700–2200 m (May 18, 1960); Ghum–Kurseong, 2200 m (Jun. 21 & 23, 1960); Happy Valley, 1900 m (Jun. 26, 1960); Batasay–Bhuspate Danra, 2400–2900 m (Dec. 1, 1963); Bilbatay Bhanjang, 2100–2200 m (Oct. 25 & 26, 1963); Bilbatay Bhanjang–Hati Sar, 1100 m (Oct. 28, 1963); Minchin Dhap–Mul Pokhari, 2800–2400 m (Oct. 29, 1963); Hati Sar–Minchin Dhap, 2700–2800 m (Oct. 28, 1963); Hilay–Murhay, 1800–2000 m (Oct. 23, 1963); Murhay, 2000 m (Oct. 24, 1963); Sinduwa, 2100 m (Oct. 23 & 24, 1963); Khebang–Bharomdin, 1700–1000 m (Nov. 24, 1963); Bhuspate Danra–Mai Majuwa, 2900–1600 m (Dec. 3, 1963).

var. **nepalense** Nishida in Journ. Jap. Bot. **41**: 319 (1966).

Sinduwa, 4100 m (Oct. 24, 1963).

Distr. sp. India, Malaysia, and S. China.

Ophioglossum petiolatum Hooker, Exot. Fl. t. 56 (1823)–Clausen in Amer. Fern Journ. **28**: 1 (1938); in Mem. Torrey Bot. Cl. **19**: 134 (1938)–Nishida in Bull. Sci. Mus. Tokyo **40**: 330 (1959).

O. vulgatum L. sensu Beddome, Handb. Ferns Brit. India 464 (1883)–Chakravarty in Bull. Bot. Soc. Beng. **5**: 3 (1951).

O. pedunculosum (non Desvaux) sensu Holttum, Fl. Malaya **2**: 39 (1954).

Dumhan–Taplejung, 700–2000 m (Nov. 1, 1963).

Distr. Tropical and temperate regions of the world.

Sceptridium daucifolium (Wallich) Lyon in Bot. Gaz. **40**: 457 (1905).

var. **daucifolium.**

Botrychium daucifolium Wallich ex Hooker & Greville, Icon. Fil. t. 161 (1829)–Beddome, Suppl. Ferns South India 28 (1876); Handb. Ferns Brit. India 469 (1883)–Clausen in Mem. Torrey Bot. Cl. **19**: 60 (1938).

Takdah, 1600–1700 m, no. 2112 (Apr. 18 & 19, 1960); Batasi, Darjeeling, 2000 m (May 2, 1960); Tendong Peak, 2400 m (Mar. 26, 1963).

Distr. India, Malaysia, S. China, and Ryukyu.

var. **parvum** (v.A.v. Rosenb.) Nishida in Journ. Jap. Bot. **41**: 319 (1966).

B. daucifolium var. *parvum* v. A. v. Rosenburgh in Bull. Jard. Bot. Buitenz. **1**: 3 (1911); Suppl. Malayan Ferns 445 (1916).

Dumhan–Taplejung, 700–2000 m (Nov. 1, 1963); Ghatte–Khebang, 1600–1700 m (Nov. 19, 1963).

Distr. Himalaya, and Java. New to Himalaya.

Sceptridium multifidum (Gmelin) Nishida ex Tagawa in Journ. Jap. Bot. **33**: 200 (1958)–Nishida in Amer. Fern Journ. **50**: 130 (1960).

var. **multifidum**

Osmunda multifidum Gmelin in Nov. Comm. Acad. Peter. **12**: 517, t. 11 (1768).

Botrychium multifidum (Gmelin) Ruprecht in Beitr. Pfl. Russ. Reiches **11**: 40 (1859).

B. ternatum non Swartz sensu Beddome, Suppl. Ferns Brit. India 110 (1892).

B. multifidum (Gmelin) Ruprecht ssp. *typicum* Clausen in Mem. Torrey Bot. Cl. **19**: 30 (1938).

Murhay, 2000 m (Oct. 23, 1963); Bilbatay Bhanjang–Hati Sar, 2200–2700 m (Oct. 27, 1963); Hati Sar–Minchin Dhap, 2700–2800 m (Oct. 28, 1963); Minchin Dhap-Mul Pokhari, 2800–2400 m (Oct. 29, 1963).

Distr. Widely distributed in the temperate zone of the northern hemisphere.

The Himalayan specimen which was identified as *B. ternatum* by Clausen (l.c.) would be this *S. multifidum* var. *multifidum*.

MARATTIACEAE (by Makoto Nishida)

Angiopteris crassipes Wallich [Cat. no. 187 (1828)] ex Presl, Suppl. Tent. Pterid. 23 (1845)–Bitter in Engl., Pfl.-fam. I, **4**: 438 (1900).

Ghorwa–Sanichare, 300–200 m (Dec. 10, 1963).

Distr. Nepal, India, and Central Asia.

Angiopteris evecta (Forst.) Hoffman, Comm. Soc. Reg. Gott. **12**: 29, t. 5 (1796)–Holttum, Flora Malaya **2**: 44 (1954).

Polypodium evectum Forst., Prodr. 81 (1786).

Rayang, Darjeeling, 250 m (Apr. 21, 1960); Illam–Ranga Pani, 1200–700 m (Dec. 8, 1963).

Distr. Himalaya, Ceylon, Malaysia, Micronesia, and Polynesia.

Angiopteris salicifolia (Presl) de Vries, Monogr. 34 (1853)–Bitter in Engl., Pfl.-fam. I, **4**: 439 (1900).

Psilodochea salicifolia Presl, Suppl. Tent. Pterid. 28 (1845).

Palmajua, 2300 m (May 4, 1960); Damthang-Temi, 2200-1800 m (Mar. 25, 1963); Ghorwa-Sanichare, 300-200 m (Dec. 10, 1963).

Distr. India.

OSMUNDACEAE (by Hirosi Ito)

Osmunda Claytoniana L., Sp. Pl. ed. 1, **2**: 1066 (1753)-Bedd., Handb. Ferns Brit. Ind. 449 (1883)-Hope in Journ. Bombay Nat. Hist. Soc. **15**: 103 (1903)-Stewart in Biologia **3** (2): 26 (1957).

Rimbick-Ramam, 1900-2400 m (May 7, 1960); Bilbatay Bhanjang-Hati Sar, 2200-2700 m (Oct. 27, 1963); Hati Sar-Minchin Dhap, 2700-2800 m (Oct. 28, 1963).

Distr. Himalaya (Kashmir to Assam), China, Korea, Japan, Siberia, and N. America.

var. **vestita** (Wall.) Milde, Monogr. Gen. Osmund. 102 (1868).

Osmunda monticola Wall. *β. vestita* Wall., Cat. no. 52 (1828).

Osmundastrum Claytonianum (L.) Tagawa var. *vestitum* (Wall.) Tagawa in Journ. Jap. Bot. **17**: 698 (1941); in Kitamura, Faun. & Fl. Nepal Himal. **1**: 78 (1955).

Batasi-Palmajua, 2300-2600 m (May 3, 1960).

Distr. Himalaya China, Formosa, and Siberia.

Beddom's description and figure are probably based on this variety.

Osmunda japonica Thunb. in Nov. Act. Reg. Soc. Sci. Upsal. **2**: 209 (1780).

Tingling Bridge-Yoksam, 1000-1700 m (May 16, 1960); Yoksam, 1700 m (May 17, 1960); Helok, 1500 m (Nov. 8, 1963).

Distr. Himalaya, China, Formosa, Korea, Japan, and Saghalin.

SCHIZAEACEAE (by Hirosi Ito)

Lygodium flexuosum (L.) Sw. in Schrad. Journ. Bot. **1800** (2): 106 (1801)-Bedd., Handb. Ferns Brit. Ind. 457 (1883).

Ophioglossum flexuosum L., Sp. Pl. ed. 1, **2**: 1063 (1753).

Peshok, 900 m (Apr. 27, 1960); Tista, 400 m (Jun. 20, 1960); Biratnagar, 200 m (Oct. 14, 1963); Dhara Pani-Dhankuta, 900-1200 m (Oct. 17, 1963); Bharomdin-Tharpu, 1000-1200 m (Nov. 25, 1963); Tharpu-near Chyangthaphu, 1200-1100 m (Nov. 26, 1963); Yektin, 1100 m (Nov. 29, 1963); Ghorwa-Sanichare, 300-200 m (Dec. 10, 1963).

Distr. India, Ceylon, Indo-China, S. China, Formosa, Ryukyu, Philippines, Malay Isls., N. Australia, Pacific Isls., and tropical Africa.

Lygodium japonicum (Thunb.) Sw. in Schrad. Journ. Bot. **1800** (2): 106 (1801)-Bedd., Handb. 457 (1883)-Hope in Journ. Bombay Nat. Hist. Soc. **15**: 106 (1903)-Steward in Biologia **3** (2): 25 (1957).

Ophioglossum japonicum Thunb., Fl. Jap. 328 (1784).

Kalimpong, 1300 m (Apr. 24, 1960); Peshok, 900 m (Apr. 27, 1960); Tingling Bridge-Yoksam, 1000-1700 m (May 16, 1960); Dhankuta, 1200 m (Oct. 19, 1963); Dumhan-Taplejung, 700-2000 m (Nov. 1, 1963); Khebang-Bharomdin, 1700-1000 m (Nov. 24, 1963); Tharpu-near Chyangthaphu, 1200-1100 m (Nov. 26, 1963); Ranga Pani-Ghorwa, 700-200 m (Dec. 9, 1963).

Distr. India, Ceylon, Indo-China, China, Korea, Formosa, Japan, Ryukyu, Philippines, and Australia.

GLEICHENIACEAE (by Hirosi Ito)

Dicranopteris linearis (Burm.) Underw. in Bull. Torrey Bot. Cl. **34**: 250 (1907)–Tagawa in Kitamura, Faun. & Fl. Nepal Himal. **1**: 78 (1955).

Polypodium lineare Burm. f., Fl. Ind. 235 (1768).

Gleichenia linearis (Burm.) Clarke in Trans. Linn. Soc. ser. 2, **1**: 428 (1880)–Bedd., Handb. 4 (1883).

Birch Hill, 2000 m (Apr. 7, 1960); Garhi Danra–Tuwa, 2200–1800 m (Nov. 4, 1963).

Distr. Widely distributed in the tropics and subtropics of the Old World.

Dicranopteris Warburgii (Christ) Nakai in Bull. Sci. Mus. Tokyo **29**: 70 (1950).

Gleichenia Warburgii Christ in Ann. Jard. Bot. Buit. **15**: 78 (1897).

Taplejung–Garhi Danra, 2000–2200 m (Nov. 3, 1963).

Distr. Himalaya (a new record), Thai, Malay Peninsula, Malay Isls., Philippines, and New Guinea.

Diplopterygium volubile (Jungh.) Nakai in Bull. Sci. Mus. Tokyo **29**: 55 (1950).

Gleichenia volubilis Jungh., Reis. d. Java, 452 (1845).

Darjeeling, 2000 m (Apr. 4 & 5, 1960; Jun. 9, & 24, 1960); Batasi–Palmajua, 2100–2300m (May 3, 1960); Sinduwa, 2100 m (Oct. 23, 1963); Bilbatay Bhanjang, 2200m (Oct. 25, 1963); Minchin Dhap–Mul Pokhari, 2800–2400 m (Oct. 29, 1963); near Chyangthaphu–Birwa, 1200–2400 m (Nov. 27, 1963); Tharpu–Khunga, 1200–2000 m (Nov. 27, 1963); Yektin–Akasay, 1400–2300 m (Nov. 30, 1963).

Distr. Himalaya (a new record), Indo-China, Formosa, Philippines, Malay Isls., and New Guinea.

HYMENOPHYLLACEAE (by Kunio Iwatsuki)

Crepidomanes late-alatum (van den Bosch) Copel. in Philip. Journ. Sci. **67**: 60 (1938)–H. Ito in Journ. Jap. Bot. **24**: 125 (1949).

Trichomanes late-alatum v. d. Bosch in Ned. Kruid. Arch. **5** (3): 138 (1863)–Copel. in Philip. Journ. Sci. **51**: 192 (1933).

Sinduwa, 1100 m (Oct. 24, 1963); Bilbatay Bhanjang, 2200 m (Oct. 25, 1963); Zongi–Iladanda, 2600–1800 m (Nov. 12, 1963); Bhuspate Dandra, 2600 m (Dec. 2, 1963).

Distr. Himalaya, and India.

Crepidomanes sp. aff. *C. Makinoi* (C. Chr.) H. Ito.

Tingling Bridge–Yoksam, 1000–1700 m (May 16, 1960;) Bakkim–Jongri, 2500–4000 m (May 19, 1960); Tuwa–Taplethok, 1800–1300 m (Nov. 5, 1963); Khebang–below Siling Tzokupa, 1700–2100 m (Nov. 20 & 22, 1963); Khebang, 1400 m (Nov. 23, 1963).

Gonocormus diffusus (Bl.) van den Bosch, Hymen. Jav. 9 (1859).

Trichomanes diffusum Bl., Enum. Pl. Jav. 225 (1828)–Copel. in Philip. Journ. Sci. **51**: 149 (1933).

Iladanda–Helok, 1800–1500 m (Nov. 13, 1963).

Distr. Himalaya to Java.

Hymenophyllum Simonsianum Hook., 2nd Cent. Ferns t. 13 (1860)–Copel. in Philip. Journ. Sci. **64**: 88 (1937).

Garibans, 2800 m (Jun. 7, 1960); Minchin Dhap-Mul Pokhari, 2800–2400 m (Oct. 29, 1963); Zongi-Iladanda, 2600–1800 m (Nov. 12, 1963); Baroya Khimty-Thakma Khola, 2500–3100 m (Nov. 12, 1963); Iladanda-Helok, 1800–1500 m (Nov. 13, 1963); Baroya Khimty-Thakma Khola, 2500–3300 m (Nov. 16, 1963); Bhuspate Danra, 2900 m (Dec. 2, 1963).

Distr. Himalaya to Formosa.

Mecodium badium (Hook. et Grev.) Copel. in Philip. Journ. Sci. **67**: 23 (1938).

Hymenophyllum badium Hook. et Grev., Icon. Fil. t. 76 (1828)–Copel. in Philip. Journ. Sci. **64**: 144 (1937).

Takdah, 1600 m (Apr. 18, 1960); Lopchu, 1500 m (Apr. 27, 1960); Rimbick, 2200 m (May 5, 1960); Yoksam–Bakkim, 1700–2200 m (May 18, 1960); Ghatte-Khebang, 1600–1700 m (Nov. 19, 1963); near Chyangthaphu-Birwa, 1100–2400 m (Nov. 27, 1963).

Distr. From Himalaya east to Formosa and west to Ceylon, extending north to Japan.

Mecodium exsertum (Wall. ex Hook.) Copel. in Philip. Journ. Sci. **67**: 23 (1938).

Hymenophyllum exsertum Wall. ex Hook., Sp. Fil. **1**: 109 (1844)–Bedd., Ferns S. Ind. t. 9 (1863); Ferns Br. Ind. t. 16 (1867)–Copel. in Philip. Journ. Sci. **64**: 153 (1937).

Senchal, 2300 m (Apr. 6, 1960); Takdah, 1600 m (Apr. 17, 1960); Palmajua-Rimbick, 2300–2200 m (May 5, 1960); Yoksam, 1700 m (May 17, 1960); Bakkim-Jongri, 2500–4000 m (May 19, 1960); Tingling Bridge–Yoksam, 1000–1700 m (May 16, 1960); Gangtok, 1600 m (Jun. 17, 1960); Darjeeling, 2100 m (Jun. 21, 1960); Sinduwa, 2100 m (Oct. 23, 1963); Murhay–Bilbatay Bhanjang, 2000–2200 m (Oct. 24, 1963); Bilbatay Bhanjang, 2200 m (Oct. 25, 1963); Bilbatay Bhanjang–Hati Sar, 2200–2700 m (Oct. 27, 1963); Hati Sar–Minchin Dhap, 2700–2800 m (Oct. 28, 1963); Mul Pokhari–Dumhan, 2400–700 m (Oct. 30, 1963); Taplejung, 1700 m (Nov. 2, 1963); Tuwa–Taplethok, 1800–1300 m (Nov. 5, 1963); Helok–Iladanda, 1500–1800 m (Nov. 8 & 13, 1963); Khebang–below Siling Tzokupa, 1700–2100 m (Nov. 20, 1963); Khebang, 1400 m (Nov. 23, 1963); Birwa–Yektin, 2400-1700 m (Nov. 28, 1963); Batasay-Bhuspate Danra, 2400–2900 m (Dec. 1, 1963); Mai Majuwa–Dhara Pani 1600–1500 m (Dec. 4, 1963).

Distr. Himalaya, India, Thai, and China.

Mecodium polyanthos (Sw.) Copel. in Philip. Journ. Sci. **67**: 19 (1938).

Hymenophyllum polyanthos Sw. in Schrad. Journ. Bot. **1800** (2): 102 (1801)–Copel. in Philip. Journ. Sci. **64**: 97 (1937).

H. Blumeanum Spr., Syst. Veg. **4**: 131 (1827)–Alston et Bonner in Candollea **15**: 197 (1956).

H. himalaianum v. d. Bosch in Ned. Kruid. Arch. **5** (3): 156 (1863).

Senchal, 2300 m (Apr. 6, 1960); Kurseong, 1600 m (Apr. 12, 1960); Batasi–Palmajua, 2300–2600 m (May 3, 1960); Palmajua–Rimbick, 2300–2200 m (May 5, 1960); Rimbick–Ramam, 1900–2400m (May 7, 1960); Pamianchi–Gayzing Bazar, 2000–2700 m (May 13, 1960): Yoksam, 1700 m (May 17, 1960); Yoksam–Bakkim, 1700–2200 m (May 18, 1960); Bakkim, Preig Chu–Jongri, 2200–4000 m (May 19, 1960); Jongri, 3500–4000 m (May 20, 1960); Jongri–Olothang, 4100–3900 m (May 23, 1960); Jongri–

Gamothang, 4200–3600 m (May 26, 1960); Gamothang–Migothang, 3800–3900 m (May 30, 1960); Chia Bhanjang, 3100 m (Jun. 2, 1960); Phalut–Chia Bhanjang, 3300 m (Jun. 3, 1960); Phalut, 3500 m (Jun. 5, 1960); Garibans, 2800 m (Jun. 7, 1960); Sinduwa, 2100 m (Oct. 24, 1963); Bilbatay Bhanjang, 2200 m (Oct. 25, 1963); Bilbatay Bhanjang–Hati Sar, 2200–2700 m (Oct. 27, 1963); Hati Sar–Minchin Dhap, 2700–2800 m (Oct. 28, 1963); Minchin Dhap–Mul Pokhari, 2800–2400 m (Oct. 29, 1963); Tuwa–Taplethok, 1800–1300 m (Nov. 5, 1963); Walunchung Gola–Zongi, 3500–2600 m (Nov. 11, 1963); Baroya Khimty–Thakma Khola, 2500–3100 m (Nov. 12, 1963); Iladanda–Helok, 1800–1500 m (Nov. 13, 1963); Thakma Khola–Diorali Bhanjang, 3200–3500 m (Nov. 11, 1963); Thakma Khola–Yamphodin, 3300–2100 m (Nov. 17, 1963); below Siling Tzokupa–Siling Tzokupa, 2100–3800 m (Nov. 21, 1963); Halhale Bhanjang–Bhuspate Danra 2800–2900 m (Dec. 1, 1963).

Distr. Tropical and subtropical regions throughout the world, often extending to the warm temperate regions.

Vandenboschia auriculata (Bl.) Copel. in Philip. Journ. Sci. **67**: 55 (1938).

Trichomanes auriculatum Bl., Enum. Pl. Jav. 225 (1828)–Copel. in Philip. Journ. Sci. **51**: 223 (1933).

T. dissectum J. Smith ex Hook., Sp. Fil. **1**: 140 (1844)–Bedd., Ferns Brit. Ind. t. 182 (1866).

Kurseong, 1600 m (Apr. 12, 1960), Lopchu, 1500 m (Apr. 28, 1960); Palmajua–Rimbick, 2300–2200 m (May 5, 1960); Rimbick, 2200 m (May 5, 1960); Sinduwa, 2100 m (Oct. 23, 1963).

Distr. Himalaya eastwards to Japan, and through Malaysia to Papua.

Vandenboschia radicans (Sw.) Copel. in Philip. Journ. Sci. **67**: 54 (1938).

Trichomanes radicans Sw. in Schrad. Journ. Bot. **1800** (2): 97 (1801)–Copel. in Philip. Journ. Sci. **51**: 213 (1933).

T. birmanicum Bedd., Ferns Brit. Ind. Suppl. 3 (1876).

Takdah, 1600 m (Apr. 18, & 19, 1960); Lopchu, 1500 m (Apr. 28, 1960); Palmajua–Rimbick, 2300–2200 m (May 5, 1960); Rimbick, 2200 m (May 5, 1960); Mai Majuwa–Dhara Pani, 1600–1500 m (Dec. 4, 1963).

Distr. Tropical and subtropical regions throughout the world.

PTERIDACEAE (by Hirosi Ito)

Actiniopteris semiflabellata Pichi-Serm. in Webbia **17**: 24, f. 4 (1962).

Dhara Pani–Dhankuta, on rocks by the Tamur River, 300 m (Oct. 17, 1963).

Distr. Africa, Arabia, and E. Himalaya (E. Nepal).

Adiantum capillus-veneris L., Sp. Pl. ed. 1, **2**: 1096 (1753)–Bedd., Handb. Ferns Brit. Ind. 84 (1883)–Hope in Journ. Bombay Nat. Hist. Soc. **13**: 239 (1900)–Tagawa in Kitamura, Faun. & Fl. Nepal Himal. **1**: 79 (1955)–Stewart in Biologia **3** (2): 22 (1957)–Nayar in Bull. Bot. Gard. Lucknow no. **52**: 25 (1961).

Kathmandu Airport, 1400 m (Oct. 13, 1963).

Distr. Widely distributed in the tropical to temperate regions of the world.

Adiantum caudatum L., Mant. Pl. 308 (1771)–Bedd., Handb. 83 (1883)–Hope, l.c. 237 (1900)–Nayar, l.c. 6 (1961).

Tista, Darjeeling, 350 m (Apr. 26, 1960); Pamianchi–Tingling Bridge, 2000–1000 m (May 15, 1960); Gangtok, 1500 m (Jun. 13, 1960); Gangtok–Saramsa Medicinal

Garden, 1000 m (Jun. 17, 1960); Kathmandu Airport, 1400m (Oct. 13, 1963); Bharomdin-Tharpu, 1000–1200 m (Nov. 25, 1963).

Distr. Africa, Arabia, India, Ceylon, Burma, Indo-China, Malay Peninsula, C. & S. China, Formosa, Philippines, Malay Isls., and New Guinea.

Adiantum Edgeworthii Hook., Sp. Fil. **2**: 14, t. 81–B (1851)–Hope, l.c. 237 (1900)–Nayar, l.c. 9 (1961).

Adiantum caudatum L. var. *β. Edgeworthii* Bedd., Handb. 84 (1883).

Iladanda–Helok, 1800–1500 m (Nov. 13, 1963); Khebang–below Siling Tzokupa, 1700–2100 m (Nov. 20, 1963).

Distr. India (Punjab to Assam), Burma, China, Formosa, Japan, Philippines, and Malay Isls.

Adiantum flabellulatum L., Sp. Pl. ed. 1, **2**: 1095 (1753)–Bedd., Handb. 88 (1883)–Nayar, l.c. 12 (1961).

Thakma Khola–Yamphodin, 3300–2100 m (Nov. 17, 1963).

Distr. India, Ceylon, Malay Peninsula, S. China, Formosa, Ryukyu, Philippines, and Malay Isls.

Adiantum philippense L., Sp. Pl. ed. 1, **2**: 1094 (1753)–Tagawa in Kitamura, Faun. & Fl. Nepal Himal. **1**: 79 (1955)–Ching, Icon. Fil. Sin. **5**: t. 214 (1958)–Nayar, l.c. 5 (1961).

Adiantum lunulatum Burm. sensu Bedd., Handb. 82 (1883)–Hope in Journ. Bombay Nat. Hist. Soc. **13**: 236 (1900).

Gangtok, 1000 m (Jun. 17, 1960); Tista, Darjeeling, 350 m (Jun. 19, 1960); Kathmandu Airport, 1400 m (Oct. 13, 1963); Biratnagar, 200 m (Oct. 15, 1963); Dhankuta, 1200 m (Oct. 20 & 21, 1963); below Siling Tzokupa–Khebang, 2100–1700 m (Nov. 22, 1963); Yektin, 1400 m (Nov. 30, 1963); Dhara Pani–Illam, 1500–1200 m (Dec. 5, 1963).

Distr. Widely distributed in the tropics and subtropics of the Old World.

Adiantum venustum D. Don, Prodr. Fl. Nepal. 17 (1825)–Bedd., Handb. 86 (1883)–Hope in Journ. Bombay Nat. Hist. Soc. **13**: 241 (1900)–Tagawa in Kitamura, Faun. & Fl. Nepal Himal. **1**: 79 (1955)–Stewart in Biologia **3** (2): 22 (1957)–Ching, l.c. t. 220 (1958)–Nayar, l.c. 16 (1961).

Takdah, Darjeeling, 1600 m (Apr. 19, 1960); Pouwa, Kathmandu, 1600 m (Oct. 9, 1963).

Distr. Afghanistan, N. India (Kashmir to Assam), and W. China.

Anogramma microphylla (Hook.) Diels in Engl., Pfl.-fam. I, **4**: 259 (1899).

Gymnogramme microphylla Hook., Icon. Pl. t. 916 (1854)–Bedd., Handb. 384 (1883).

Chia Bhanjang–Dentam, 2500 m (May 11, 1960).

Distr. Himalaya, and China.

Cheilanthes albomarginata Clarke in Trans. Linn. Soc. ser. 2. **1**: 456 (1880)–Bedd., Handb. 94 (1883)–Hope in Journ. Bombay Nat. Hist. Soc. **13**: 245 (1900)–Stewart in Biologia **3** (2): 20 (1957)–Nayar in Bull. Bot. Gard. Lucknow no. **68**: 26 (1962).

Cheilanthes farinosa (Forsk.) Kaulf. var. *albomarginata* Bedd., Handb. Suppl. 22 (1892).

Darjeeling, 2000 m (Apr. 1, 1960); Victoria Fall, Darjeeling, 1900m (Apr. 2, 1960);

Batasi, 2000m (May 2, 1960); Palmajua-Rimbick, 2300–2200m (May 5, 1960); Rimbick, 2200 m (May 5, 1960); Phusri-Dhara Pani, 450–900 m (Oct. 16, 1963); Taplethok-Helok, 1300–1500 m (Nov. 6, 1963); Ghatte-Khebang, 1600–1700 m (Nov. 19, 1963).

Distr. Himalaya (Kashmir to Assam), and S. India.

Cheilanthes chrysophylla Hook., Icon. Pl. **2**: 113 (1852)–Nayar, l.c. 21 (1962).

Bilbatay Bhanjang–Hati Sar, 2200–2700 m (Oct. 27, 1963); Hati Sar–Minchin Dhap, 2700–2800 m (Oct. 28, 1963); Minchin Dhap–Mul Pokhari, 2800–2400 m (Oct. 29, 1963).

Distr. Himalaya (Nepal to Assam).

Cheilanthes farinosa (Forsk.) Kaulf., Enum. Fil. 202 (1824)–Bedd., Handb. 92 (1883)–Hope in Journ. Bombay Nat. Hist. Soc. **13**: 248 (1900)–Stewart in Biologia **3** (2): 21 (1957)–Nayar, l.c. 23 (1962).

Pteris farinosa Forsk., Fl. Aegyp.-Arab. 187 (1775).

Senchal, Darjeeling, 2300 m (Apr. 6, 1960); Kurseong, Darjeeling, 1600 m (Apr. 12, 1960); Takdah, Darjeeling, 1600–1700 m (Apr. 19, 1960); Palmajua–Rimbick, 2300–2200 m (May 5, 1960); Yoksam–Bakkim, 1700–2000 m (May 16, 1960); Helok-Iladanda, 1500–1800 m (Nov. 8, 1963); Iladanda–Selap, 1800–2600 m (Nov. 9, 1963); Yamphodin–Ghatte, 2100–1600 m (Nov. 18, 1963).

Distr. India, Ceylon, Burma, S. W. China, Formosa, Philippines, Malay Peninsula, and other tropical regions of the world.

Cheilanthes Hancockii Bak. in Kew Bull. **1895**: 54 (1895)–Ching, Icon. Fil. Sin. **3**: t. 134 (1935).

Pamianchi–Tingling Bridge, 2000–1000 m (May 15, 1960); Penlong La, Gangtok, 2100 m (Jun. 16, 1960); Gangtok–Saramsa Medicinal Garden, 1000 m (Jun. 17, 1960); Kalimpong, 1300 m (Jun. 20, 1960); Kathmandu Airport, 1400 m (Oct. 13, 1963); Phusri–Dhara Pani, 450–900 m (Oct. 16, 1963); Dumhan, 800 m (Oct. 31, 1963); Dumhan–Taplejung, 700–2000 m (Nov. 1, 1963); Bharomdin–Tharpu, 1000–1200 m (Nov. 25, 1963); Ranga Pani–Ghorwa, 700–300 m (Dec. 9, 1963).

Distr. Himalaya (a new record) and W. China (Yunnan, Szechuan).

Cheilanthes Kuhnii Milde in Bot. Zeit. **25**: 149 (1867).

Baroya Khimty–Thakma Khola, 2500–3300 m (Nov. 16, 1963).

Distr. Himalaya (a new record), N. China, and Korea.

Cheilanthes rufa D. Don, Prodr. Fl. Nepal. 16 (1825)–Bedd., Handb. 94 (1883)–Hope in Journ. Bombay Nat. Hist. Soc. **13**: 247 (1900)–Nayar in Bull. Bot. Gard. Lucknow no. **68**: 17 (1962).

Yoksam, 1700 m (May 17, 1960); Ghatte-Khebang, 1600–1700m (Nov. 19, 1963).

Distr. Himalaya (Nepal to Assam).

Cheilanthes tenuifolia (Burm.) Sw., Syn. Fil. 129, 332 (1806)–Bedd., Handb. 92 (1883)–Nayar, l. c. 29 (1962).

Trichomanes tenuifolium Burm. f., Fl. Ind. 237 (1768).

Dumhan, 700 m (Oct. 31, 1963); Dumhan–Taplejung, 700–2000 m (Nov. 1, 1963).

Distr. India, Ceylon, China, Formosa, Philippines, Malay Isls., Australia, New Zealand, and Polynesia.

Coniogramme caudata (Wall.) Ching in C. Chr., Ind. Fil. Suppl. 3: 56

(1934)-Ching, Icon. Fil. Sin. **4**: t. 167 (1937).

Grammitis caudata Wall., Cat. no. 4 (1828).

Batasi, 2000 m (May 2, 1960); Palmajua-Rimbick, 2300–2200 m (May 5, 1960); Rimbick–Ramam, 1900–2400 m (May 7, 1960); Pamianchi–Ratong Chu, 2000–1000 m (May 15, 1960); Yoksam–Bakkim, 1700–2200 m (May 18, 1960); Murhay, Dhankuta Dist., 2000m (Oct. 23, 1963); Murhay–Bilbatay Bhanjang, 2000–2200m (Oct. 24, 1963); Helok–Iladanda, 1500–1800 m (Nov. 8, 1963); Iladanda–Selap, 1800–2600 m (Nov. 9, 1963); Zongi–Iladanda, 2600–1800 m (Nov. 12, 1963); Yektin–Batasay, 1400–2400 m (Nov. 30, 1963).

Distr. Himalaya, and W. China (Yunnan).

Coniogramme fraxinea (D. Don) Diels in Engl., Pfl.-fam. I, **4**: 262 (1899)-Ching, Icon. Fil. Sin. **4**: t. 166 (1937).

Diplazium fraxineum D. Don, Prodr. Fl. Nepal. 12 (1825).

Syngramme fraxinea (D. Don) Bedd., Handb. 386 (1883).

Rhenock, Sikkim, 1100 m (Mar. 19, 1963); Tharpu-near Chyangthaphu, 1200–1100 m (Nov. 26, 1963); Yektin–Akasay, 1400–2300 m (Nov. 30, 1963); Ranga Pani–Ghorwa, 700–300 m (Dec. 9. 1963).

Distr. Himalaya, S. India, W. China (Yunnan), Philippines, Java, and Formosa.

Coniogramme intermedia Hieron. in Hedw. **57**: 301 (1916)-Ching, Icon. Fil. Sin. **4**: t. 143 (1935)-Stewart in Biologia **3** (2): 18 (1957).

var. **glabra** Ching, l.c. (1935).

Taplejung, 1700m (Nov. 2, 1963); Garhi Danra–Tuwa, 2200–1800m (Nov. 4, 1963); Tuwa–Taplethok, 1800–1300 m (Nov. 5, 1963); Helok, 1500 m (Nov. 8, 1963); Zongi-Iladanda, 2600–1800 m (Nov. 12, 1963); Iladanda–Helok, 1800–1500 m (Nov. 13, 1963); Baroya Khimty–Thakma Khola, 2500–3300 m (Nov. 16, 1963); Ghatte–Khebang, 1600–1700 m (Nov. 19, 1963); Khebang–below Siling Tzokupa, 1700–2100 m (Nov. 20, 1963).

Distr. Himalaya, Indo-China, China, Korea, Formosa, and Japan.

var. **villosa** Ching, Icon. Fil. Sin. **4**: t. 143 (1935).

Khebang–below Siling Tzokupa, 1700–2100 m (Nov. 20, 1963).

Distr. N. India, China, and Japan.

Coniogramme procera (Wall.) Fée, 10 Mém. 22 (1865)-Ching, Icon. Fil. Sin. **4**: t. 168 (1937).

Grammitis procera Wall., Cat. no. 3 (1828).

Preig Chu–Bakkim, 2200 m (May 19, 1960); Murhay–Bilbatay Bhanjang, 2000–2200 m (Oct. 24, 1963); Sinduwa, 2100 m (Oct. 24, 1963); Bilbatay Bhanjang–Hati Sar, 2200–2700 m (Oct. 27, 1963); Minchin Dhap–Mul Pokhari, 2800–2400 m (Oct. 29, 1963); Helok–Iladanda, 1500–1800 m (Nov. 8, 1963); Zongi–Iladanda, 2600–1800 m (Nov. 12, 1963); Baroya Khimty–Thakma Khola, 2500–3300 m (Nov. 16, 1963); Yektin–Akasay, 1400–2300 m (Nov. 30, 1963).

Distr. Himalaya, W. China (Yunnan), and Formosa.

Cryptogramma Brunoniana Wall. [Cat. no. 396 (1828)] ex Hook. et Grev., Icon. Fil. t. 158 (1829)-Bedd., Ferns Brit. Ind. 164 (1868)-Tagawa in Kitamura, Faun. & Fl. Nepal Himal. **1**: 79 (1955)-Stewart in Biologia **3** (2): 19 (1957).

Jongri–Olothang, 3900 m (May 23, 1960); Jongri–Gamothang, 3800–4000 m (May

26, 1960); Gamothang, 3800 m (May 27 & 29, 1960); Migothang, 3900 m (May 31, 1960).

Distr. Himalaya, China, and Formosa.

Dennstaedtia appendiculata (Wall.) J. Sm., Hist. Fil. 265 (1875)-Bedd., Handb. 26 (1883).

Dicksonia appendiculata Wall., Cat. no. 65 (1828)-Hook., Sp. Fil. **1**: 79 (1844)-Clarke in Trans. Linn. Soc. ser. 2, **1**: 436 (1880)-Hope in Journ. Bombay Nat. Hist. Soc. **13**: 28 (1900).

Darjeeling, 2000 m (Apr. 2, 1960); Palmajua-Rimbick, 2300-2200 m (May 5, 1960); Rimbick-Ramam, 1900-2400 m (May 7, 1960); Helok-Iladanda, 1500-1800 m (Nov. 8, 1963); Iladanda-Selap, 1800-2600 m (Nov. 9, 1963); Zongi-Iladanda, 2600-1800 m (Nov. 12, 1963).

Distr. E. Himalaya (Nepal, Sikkim), and W. China (Szechuan).

Dennstaedtia scabra (Wall.) Moore, Ind. Fil. 307 (1861)-Bedd., Handb. 24 (1883).

Dicksonia scabra Wall., Cat. no. 2173 (1829)-Hook., Sp. Fil. **1**: 80 (1844)-Clarke in Trans. Linn. Soc. ser. 2, **1**: 436 (1880)-Hope in Journ. Bombay Nat. Hist. Soc. **13**: 28 (1900).

Darjeeling, 2000 m (Apr. 2, 1960); Victoria Fall, Darjeeling, 1900 m (Apr. 3, 1960); Yoksam-Bakkim, 1700-2200 m (May 18, 1960); Birch Hill, Darjeeling, 2000 m (Jun. 18, 1960); Bilbatay Bhanjang, 2200 m (Oct. 26, 1963); Bilbatay Bhanjang-Hati Sar, 2200-2700 m (Oct. 27, 1963); Taplejung, 1700 m (Nov. 2, 1963); Taplejung-Garhi Danra, 2000-2200 m (Nov. 3, 1963); Birwa-Yektin, 2400-1700 m (Nov. 28, 1963); Yektin-Batasay, 1400-2400 m (Nov. 30, 1963).

Distr. Himalaya (Punjab to Assam), Ceylon, Burma, Indo-China, S. & C. China, S. Korea, Formosa, Japan, Philippines, Malay Peninsula, Borneo, and Celebes.

Doryopteris concolor (Langsd. et Fisch.) Kuhn in v. Deck., Reis. Ostafr. **3** (3): Bot. 19 (1879).

Pteris concolor Langsd. et Fisch., Icon. Fil. 19, t. 21 (1810).

Pellaea concolor (Langsd. et Fisch.) Bak., Fl. Brasil. **1** (2): 396 (1870)-Bedd., Handb. 100 (1883).

Helok-Iladanda, 1500-1800 m (Nov. 8, 1963); Iladanda-Selap, 1800-2600 m (Nov. 9, 1963).

Distr. India, Ceylon, China, Formosa, Philippines, and many other tropical regions.

Histiopteris incisa (Thunb.) J. Sm., Hist. Fil. 295 (1875).

Pteris incisa Thunb., Prodr. Fl. Cap. 171 (1800).

Lithobrochia incisa (Thunb.) Presl, Tent. Pterid. 149 (1836)-Bedd., Handb. 120 (1883).

Pamianchi, Sikkim, 2000 m (May 15, 1960).

Distr. Widely distributed in the tropics and subtropics of the world.

Hypolepis punctata (Thunb.) Mett. in Kuhn, Fil. Afr. 120 (1868)-Bedd., Handb. Suppl. 19 (1892)-Stewart in Biologia **3** (2): 11 (1957).

Polypodium punctatum Thunb., Fl. Jap. 337 (1784).

Kathmandu Airport, 1400 m (Oct. 13, 1963); Hilay-Murhay, 1800-2000 m (Oct.

23, 1963); Hati Sar–Minchin Dhap, 2700–2800 m (Oct. 28, 1963); Taplejung, 1700 m (Nov. 2, 1963); Iladanda–Helok, 1800–1500 m (Nov. 13, 1963); Mai Majuwa–Dhara Pani, 1600–1500 m (Dec. 4, 1963).

Distr. Himalaya, India, Indo-China, Malay Peninsula, C. & S. China, S. Korea, Formosa, Japan, Philippines, Malay Isls., New Zealand, Australia, Hawaii, and tropical America.

Lindsaea cultrata (Willd.) Sw., Syn. Fil. 119 (1806)–Bedd., Handb. 72 (1883).

Adiantum cultratum Willd., Phytogr. 14 (1794).

Darjeeling, 2000 m (Apr. 2, 1960); Victoria Fall, Darjeeling, 1900 m (Apr. 3, 1960); Batasi–Palmajua, 2300–2600 m (May 3, 1960); Bilbatay Bhanjang, 2200 m (Oct. 25, 1963); Dumhan, 700 m (Oct. 31, 1963); Taplethok–Helok, 1300–1500 m (Nov. 6, 1963); Zongi–Iladanda, 2600–1800 m (Nov. 12, 1963); Iladanda–Helok, 1800–1500 m (Nov. 13, 1963); below Siling Tzokupa–Khebang, 2100–1700 m (Nov. 22, 1963); Mai Majuwa–Dhara Pani, 1600–1500 m (Dec. 4, 1963).

Distr. E. African Isls., India, Ceylon, Burma, Indo-China, Malay Peninsula, C. & S. China, Formosa, Japan, Malay Isls., and N. Australia.

Microlepia speluncae (L.) Moore, Ind. Fil. 93 (1857)–Bedd., Handb. 67 (1883)–Nayar et Kaur in Bull. Bot. Gard. Lucknow no. **79**: 22 (1963).

Polypodium speluncae L., Sp. Pl. ed. 1, **2**: 1093 (1753).

Tista, Darjeeling, 300 m (Apr. 26, 1960); Lopchu, Darjeeling, 1500 m (Apr. 28, 1960); Peshok, 900 m (Apr. 29, 1960); Saramsa Medicinal Garden, Gangtok, 800 m (Jun. 17, 1960); Rhenock, 1100 m (Mar. 19, 1963); Sanichare–Sibganja, 200 m (Dec. 11, 1963).

Distr. India, Ceylon, Malay Peninsula, Indo-China, S. W. China, Ryukyu, Formosa, Philippines, Malay Isls., Polynesia, and tropical America.

Microlepia todayensis Christ in Philip. Journ. Sci. **3**: 272 (1908)–Nayar et Kaur, l.c. 18, f. 51, 55 (1963).

Pouwa, Kathmandu, 1600 m (Oct. 9, 1963); Kathmandu Airport, 1400 m (Oct. 13, 1963); Helok–Iladanda, 1500–1800 m (Nov. 8, 1963); Illam–Jog Mai–Ranga Pani 1200–700 m (Dec. 8, 1963).

Distr. India, Philippines, and Malay Isls.

Microlepia trapeziformis (Roxb.) Kuhn, Chaetopt. 347 (1882)–Ching, Fl. Reipubl. Popul. Sin. **2**: 229 (1959).

Davallia trapeziformis Roxb. in Calcut. Journ. **4**: 516 (1844).

Takdah, Darjeeling, 1600 m (Apr. 19, 1960); Lopchu, 1500 m (Apr. 28, 1960); Batasi–Palmajua, 2300–2600 m (May 3, 1960); Palmajua–Rimbick, 2300–2200 m (May 5, 1960); Yoksam–Bakkim, 1700–2500 m (May 18, 1960); Ghatte–Khebang, 1600–1700 m (Nov. 19, 1963).

Distr. India, Burma, Indo-China, Formosa, Philippines, and Malay Isls.

Monachosorum Henryi Christ in Bull. Herb. Boiss. **6**: 869 (1898)–Ching, Fl. Reipubl. Popul. Sin. **2**: 255 (1959).

Senchal, Darjeeling, 2300 m (Apr. 6, 1960); Palmajua–Rimbick, 2300–2200 m (May 5, 1960); Rimbick–Ramam, 1900–2400 m (May 7, 1960); Yoksam–Bakkim, 1900–2200 m (May 18, 1963); Iladanda–Selap, 1800–2600 m (Nov. 9, 1963); Zongi–Iladanda, 2600–1800 m (Nov. 12, 1963); Khunga Churi–Yektin, 2000–1700m (Nov. 28, 1963); Birwa–Yektin, 2400–1700 m (Nov. 28, 1963); Batasay–Bhuspate Danra, 2400–2900 m (Dec. 1, 1963).

Distr. Himalaya, Viet Nam, S. China, and Formosa.

Notholaena marantae (L.) R. Br., Prodr. Fl. Nov. Holl. 146 (1810)-Bedd., Handb. 373 (1883)-Hope in Journ. Bombay Nat. Hist. Soc. **13**: 98 (1901)-Stewart in Biologia **3** (2): 20 (1957).

Acrostichum marantae L., Sp. Pl. ed. 1, **2**: 1071 (1753).

Walunchung Gola-Zongi, 3500-2600 m (Nov. 11, 1963).

Distr. Mediterranean region, Ethiopia, Caucasus, Himalaya, W. India, W. China (Szechuan, Yunnan), and Macaronesia,.

Onychium contiguum (Wall.) Hope in Journ. Bombay Nat. Hist. Soc. **13**: 444 (1901)-Ching in Lingnan Sci. Journ. **13**: 498 (1934)-Tagawa in Kitamura, Faun. & Fl. Nepal Himal. **1**: 79 (1955)-Stewart in Biologia **3** (2): 21 (1957).

Cheilanthes contigua Wall., Cat. no. 72 (1828).

Dhankuta-Sinduwa, 1200-2100 m (Oct. 22, 1963); Dhankuta-Hilay, 1200-1800 m (Oct. 23, 1963); Hilay-Murhay, 1800-2000 m (Oct. 23, 1963); Minchin Dhap-Mul Pokhari, 2800-2400 m (Oct. 29, 1963); Iladanda-Selap, 1800-2600 m (Nov. 9, 1963); Selap-Walunchung Gola, 2600-3500 m (Nov. 10, 1963).

Distr. Himalaya (Kashmir to Sikkim), Tibet, Thai, and W. China (Yunnan).

Onychium japonicum (Thunb.) Kunze in Bot. Zeit. **6**: 507 (1848)-Bedd., Handb. 96 (1883)-Hope in Journ. Bombay Nat. Hist. Soc. **13**: 443 (1901)-Ching in Lingnan Sci. Journ. **13**: 496 (1934)-Stewart in Biologia **3** (2): 22 (1957).

Trichomanes japonicum Thunb., Fl. Jap. 340 (1784).

Lopchu, Darjeeling, 1500 m (Apr. 28, 1960); Mani Bhanjang-Batasi, 2000-2100m (May 1, 1960); Rimbick-Ramam, 1900-2400 m (May 7, 1960); Gangtok, 1600 m (Jun. 15, 1960); Taplejung-Garhi Danra, 2000-2200 m (Nov. 3, 1963); Khebang-below Siling Tzokupa, 1700-2100 m (Nov. 20, 1963).

Distr. Himalaya (Punjab to Assam), Burma, China, Korea, Formosa, Japan, Philippines, and Java.

Onychium siliculosum (Desv.) C. Chr., Ind. Fil. 468 (1906)-Ching in Lingnan Sci. Journ. **13**: 495 (1934).

Pteris siliculosa Desv. in Berlin. Mag. **5**: 324 (1811).

Onychium auratum Kaulf., Enum. Fil. 144 (1824)-Bedd., Handb. 96 (1883)-Hope in Journ. Bombay Nat. Hist. Soc. **13**: 443 (1901).

Rayang, Darjeeling, 250 m (Apr. 20 & 21, 1960); Kalimpong, 1300 m (Apr. 24, 1960); Rangpo-Tista, 400-350 m (Jun. 18, 1960); Singtam-Temi, 650 m (Mar. 25, 1963); Phusri-Dhara Pani, (Oct. 16, 1963); Tuwa-Taplethok, 1800-1300 m (Nov. 5, 1963); below Siling Tzokupa-Khebang, 2100-1700 m (Nov. 22, 1963); Bharomdin-Tharpu, 1000-1200 m (Nov. 25, 1963); Dhara Pani-Illam, 1500-1200 m (Dec. 5, 1963); Illam-Ranga Pani, 1200-700 m (Dec. 8, 1963).

Distr. Himalaya (Nepal to Assam), Burma, Indo-China, Malay Peninsula, W. China (Yunnan), Formosa, Philippines, Malay Isls., New Guinea, and Polynesia.

Pityrogramma calomelanos (L.) Link, Handb. d. Gew. **3**: 20 (1833).

Acrostichum calomelanos L., Sp. Pl. ed. 1, **2**: 1072 (1753).

Pellaea calomelanos (L.) Link, Fil. Sp. 61 (1841)-Bedd., Handb. 104 (1883)-Hope in Journ. Bombay Nat. Hist. Soc. **13**: 448 (1901).

Rayang, Darjeeling, 250 m (Apr. 20, 1960); Saramsa Medicinal Garden, Gangtok, 1000 m (Jun. 17, 1960); Singtam–Temi, 650 m (Mar. 25, 1963); Phusri–Dhara Pani, 450–900 m (Oct. 16, 1963); Khebang–below Siling Tzokupa, 1700–2100 m (Nov. 20, 1963); Bharomdin–Tharpu, 1000–1200 m (Nov. 25, 1963); Illam–Jag Mai–Ranga Pani, 1200–700 m (Dec. 8, 1963); Ranga Pani–Ghorwa, 700–300 m (Dec. 9, 1963); Sanichare–Sibganja, 200 m (Dec. 11, 1963).

Distr. Naturalized from tropical America.

Pteridium aquilinum (L.) Kuhn in v. Deck., Reis. Ostafr. **3** (3): Bot. 11 (1879)–Stewart in Biologia **3** (2): 23 (1957).

Pteris aquilina L., Sp. Pl. ed. 1, **2**: 1075 (1753)–Bedd., Handb. 115 (1883)–Hope in Journ. Bombay Nat. Hist. Soc. **13**: 455 (1901).

var. **Wightianum** (Wall.) Tryon in Rhodora **43**: 22 (1941).

Pteris Wightiana Wall., Cat. no. 2178 (1828).

Butia Basti, Darjeeling, 1900 m (Apr. 6, 1960); Takdah, 1600 m (Apr. 19, 1960); Tingling Bridge–Yoksam, 1000–1700 m (May 16, 1960); Gangtok Orchid Sanctuary, 1500 m (Mar. 18, 1963); Dhankuta, 1200 m (Oct. 18, 1963); Minchin Dhap–Mul Pokhari, 2800–2400 m (Oct. 29, 1963); below Siling Tzokupa–Siling Tzokupa, 2100–3800 m (Nov. 21, 1963); Mai Majuwa–Dhara Pani, 1600–1500 m (Dec. 4, 1963).

Distr. sp. E. Himalaya (Nepal to Assam), Ceylon, Indo-China, Malay Peninsula, Malay Isls., Philippines, and Formosa.

Pteris biaurita L., Sp. Pl. ed. 1, **2**: 1076 (1753)–Hope in Journ. Bombay Nat. Hist. Soc. **13**: 455 (1901).

Campteria biaurita (L.) Hook., Gen. Fil. 65-A (1841)–Bedd., Handb. 116 (1883).

Siliguri–Kurseong (Apr. 29, 1960); Rhenock, 1100 m (Mar. 19, 1963); Kathmandu Airport, 1400 m (Oct. 13, 1963); Phusri–Dhara Pani, 450–900 m (Oct. 16, 1963); Dhankuta, 1200m (Oct. 20, 1963); Garhi Danra–Tuwa, 2200–1800m (Nov. 4, 1963); Tuwa–Taplethok, 1800–1300 m (Nov. 5, 1963); Khebang–below Siling Tzokupa, 1700–2100m (Nov. 20 & 22, 1963); Bharomdin–Tharpu, 1000–1200m (Nov. 25, 1963); Dhara Pani–Illam, 1500–1200 m (Dec. 5, 1963); Illam, 1200 m (Dec. 7, 1963); Ranga Pani–Ghorwa, 700–300 m (Dec. 9, 1963).

Distr. Widely distributed in the tropics of the world.

Pteris cretica L., Mant. Pl. 130 (1767)–Bedd., Handb. 106 (1883)–Hope in Journ. Bombay Nat. Hist. Soc. **13**: 449 (1901)–Tagawa in Kitamura, Faun. & Fl. Nepal Himal. **1**: 78 (1955)–Stewart in Biologia **3** (2): 23 (1957).

Lopchu, Darjeeling, 1500 m (Apr. 28, 1960); Palmajua–Rimbick, 2200 m (May 5, 1960); Ramam, Darjeeling, 2400 m (May 8, 1960); Dhankuta–Murhay, 1200–2000 m (Oct. 23, 1963); Murhay–Bilbatay Bhanjang, 2000–2200 m (Oct. 24 & 26, 1963); Taplejung–Garhi Danra, 2000–2200 m (Nov. 3, 1963); Taplethok–Helok, 1300–1500 m (Nov. 6, 1963); Helok–Iladanda, 1500–1800 m (Nov. 8, 1963); Iladanda–Selap, 1800–2600 m (Nov. 9, 1963); Batasay–Bhuspate Danta, 2400–2800 m (Dec. 1, 1963).

Distr. Widely distributed in tropical and temperate regions of the world.

Pteris dactylina Hook., Sp. Fil. **2**: 160, t. 130-A (1858)–Bedd., Handb. 107 (1883)–Hope in Journ. Bombay Nat. Hist. Soc. **13**: 451 (1901).

Selap–Walunchung Gola, 2600–3500 m (Nov. 10, 1963); Baroya Khimty–Thakma Khola, 2500–3300 m (Nov. 16, 1963).

Distr. E. Himalaya (Nepal to Assam), W. China (Szechuan, Yunnan), and Formosa.

Pteris ensiformis Burm. f., Fl. Ind. 230 (1768)–Bedd., Handb. 107 (1883).

Pouwa, Kathmandu, 1600 m (Oct. 9, 1963).

Distr. India, Ceylon, Burma, Malay Peninsula, S. China, Formosa, Ryukyu, Philippines, Malay Isls., tropical Australia, Polynesia, and Micronesia.

Pteris excelsa Gaud. in Freyc., Voy. Bot. 388 (1827)-Bedd., Handb. 114 (1883)-Hope in Journ. Bombay Nat. Hist. Soc. **13**: 454 (1901)-Stewart in Biologia **3** (2): 23 (1957).

Pteris longipinnula Wall., Cat. no. 108 (1828)-Bedd., Handb. 112 (1883).

Helok-Iladanda, 1500–1800 m (Nov. 8, 1963).

Distr. Himalaya, S. & C. China, S. Korea, Formosa, Japan, Philippines, Malay Isls., and Hawaii.

Pteris longipes D. Don, Prodr. Fl. Nepal. 15 (1825)-Bedd., Handb. 115 (1883).

Lopchu, 1500 m (Apr. 28, 1960); Yoksam, 1700 m (May 17, 1960); Yoksam-Bakkim, 1700–2200 m (May 18, 1960); Rhenock, 1100 m (Mar. 19, 1963); Khebang-below Siling Tzokupa, 1700–2100 m (Nov. 20, 1963).

Distr. E. Himalaya, Ceylon, Burma, Philippines, Formosa, Java, and New Guinea.

Pteris nepalensis H. Ito, sp. nov. [Pl. 25]

Rhizoma breviter repens, paleis brunneis linearibus margine fuscis membranaceis breviter fimbriatis densissime vestitum. Stipites lucidi glabri approximati firmi 35–40 cm longi 1–2 mm lati in diametro rufescentes. Laminae frondum ovatae vel longe ovatae 40–50 cm longae, 25–35 cm latae pinnatae, pinnis 4–7-jugis linearibus acuminatis basi sessilibus vel brevissime stipitatis, pectinatim pinnatis, pinnulis linearibus acutis basi latissimis confluentibus ad costas, margine integris, venis pinnatis, et venulis unifurcatis et ad margines attingentibus, supra costas apud basin venarum setulosis, pinnulis primis (rare etiam secundis) inferioribus pinnarum infimarum extraordinariter elongatis et pinnarum ceterarum similibus, etiam pinnis terminalibus laminarum similibus. Sori marginales, indusiis membranaceis pallidi-fuscis linearibus 1–3 cm longis 0.6–0.8 mm latis margine integris. Sporangia cellulis annularibus 18–20, sporis tetrahedralibus humiliter alatis.

E. Nepal: Hati Sar-Minchin Dhap, 2700-2800 m (Hara, Kanai, Kurosawa, Murata, Togashi & Tuyama, Oct. 28, 1963—Typus in TI); Minchin Dhap-Mul Pokhari, 2800-2400 m (Oct. 29, 1963); Diorali Bhanjang-Bhandukay, 3500-2400 m (Nov. 14, 1963); Thakma Khola-Yamphodin, 3300–2100 m Nov. 17, 1963); Yektin-Akasay, 2400–2300 m (Nov. 30, 1963); Batasay-Bhuspate Danra, 2400–2900 m (Dec. 1, 1963).

Distr. Himalaya (endemic).

This fern looks like a form of *P. excelsa* with small fronds, but the venation is similar to that of *P. quadriaurita*. Formosan species, *P. arisanensis* Tagawa and *P. bella* Tagawa seem to be closely allied to this one.

Pteris pellucida Presl, Rel. Haenck. **1**: 55 (1825)-Bedd., Handb. 106 (1883)

Bilbatay Bhanjang, 2200 m (Oct. 26, 1963); Batasay-Bhuspate Danra, 2400-2900 m (Dec. 1, 1963).

Distr. Himalaya India, Burma, Malay Isls., Philippines, and Formosa.

Pteris quadriaurita Retz., Obs. Bot. **6**: 38 (1791)-Bedd., Handb. 110 (1883)-

Hope in Journ. Bombay Nat. Hist. Soc. **13**: 452 (1901)–Stewart in Biologia **3** (2): 23 (1957).

Butia Basti, Darjeeling, 1900 m (Apr. 6, 1960); Senchal–Takdah, 2400–1600 m (Apr. 17, 1960); Takdah, Darjeeling, 1600 m (Apr. 19, 1960); Mani Bhanjang–Batasi, 2000–2100 m (May 1, 1960); Palmajua–Rimbick, 2300–2200 m (May 5, 1960); Dhankuta–Murhay, 1200–2000 m (Oct. 23, 1963); Taplejung, 1900 m (Nov. 2, 1963); Tuwa–Taplethok, 1800–1300 m (Nov. 5, 1963); Taplethok–Helok, 1300–1500 m (Nov. 6, 1963); Helok–Iladanda, 1500–1800 m (Nov. 8 & 13, 1963); Zongi–Iladanda, 2600–1800 m (Nov. 12, 1963); Yamphodin–Ghatte, 2100–1600 m (Nov. 18, 1963).

Distr. Widely distributed in the tropics and subtropics of the world.

Pteris setuloso-costulata Hayata, Icon. Pl. Formos. **4**: 241, f. 168 (1914).

Birch Hill, Darjeeling, 2000 m (Apr. 7, 1960); Yoksam–Bakkim, 1700–2200 m (May 18, 1960).

Distr. E. Himalaya, Philippines, Formosa, and Japan (Isl. Yakusima).

Pteris subquinata Wall. [Cat. no. 104 (1828)] ex Hope in Journ. Bombay Nat. Hist. Soc. **13**: 452, t. 17 (1901).

Khebang–below Siling Tzokupa, 1700–2100 m (Nov. 20, 1963).

Distr. E. Himalaya (Nepal, Sikkim).

Pteris venusta Kunze in Bot. Zeit. **6**: 195 (1848).

Ranga Pani–Ghorwa, 700–300 m (Dec. 9, 1963); Ghorwa–Sanichare, 300–200 m (Dec. 10, 1963).

Distr. Himalaya, Burma, Indo-China, Malay Isls., and Formosa.

Pteris vittata L., Sp. Pl. ed. 1, **2**: 1074 (1753)–Stewart in Biologia **3** (2): 23 (1957).

P. longifolia L. sensu Bedd., Handb. 106 (1883)–Hope in Journ. Bombay Nat. Hist. Soc. **13**: 148 (1901).

Tista, Darjeeling, 350 m (Jun. 19 & 20, 1960); Pouwa, Kathmandu, 1600 m (Oct. 9, 1963); Phusri–Dhara Pani, 450–900 m (Oct. 16, 1963); Yamphodin–Ghatte, 2100–1600 m (Nov. 18, 1963); below Siling Tzokupa–Khebang, 2100–1700 m (Nov. 22, 1963).

Distr. Widely distributed in the tropics and subtropics of the Old World.

Pteris Wallichiana Agardh, Recens. Sp. Gen. Pter. 69 (1839)–Hope in Journ. Bombay Nat. Hist. Soc. **13**: 456 (1901).

Campteria Wallichiana (Ag.) Moore, Ind. Fil. 221 (1861)–Bedd., Handb. 118 (1883).

Gangtok, 1700 m (Jun. 15, 1960); Pouwa, Kathmandu, 1600 m (Oct. 9, 1963); Dhara Pani–Dhankuta, 900–1200 m (Oct. 17, 1963); Hilay–Murhay, 1800–2000 m (Oct. 23, 1963); Bilbatay Bhanjang, 2200 m (Oct. 25, 1963); Bilbatay Bhanjang–Hati Sar, 2200–2700 m (Oct. 27, 1963); Thakma Khola–Yamphodin, 3500–2100 m (Nov. 17, 1963); Yektin–Akasay, 1400–2300 m (Nov. 30, 1963).

Distr. Himalaya (Punjab to Assam), S. China, Formosa, Japan, Philippines, Malay Isls., and Samoa Isls.

Sphenomeris chusana (L.) Copel. in Bishop Mus. Publ. **59**: 69 (1929).

Adiantum chusanum L., Sp. Pl. ed. 1, **2**: 1095 (1753).

Davallia tenuifolia Sw. in Schrad. Journ. Bot. **1800** (2): 88 (1801)–Hope in Journ. Bombay Nat. Hist. Soc. **13**: 35 (1900).

Stenoloma chinense (L.) Bedd., Handb. 70 (1883).

S. chusanum (L.) Ching in Sinensia **3**: 338 (1933).

Happy Valley, Darjeeling, 1900 m (Apr. 7, 1960); Takdah, 1600–1700 m (Apr. 19, 1960); Gangtok, 1650 m (Apr. 26, 1960); Penlong La, Gangtok, 2100 m (Jun. 16, 1960); Tista–Kalimpong, 350–1300 m (Jun. 19, 1960); Saramsa, 1200 m (Mar. 21, 1963); Mul Pokhari–Dumhan, 2400–700 m (Oct. 30, 1963); Dumhan–Taplejung, 700–2000 m (Nov. 1, 1963).

Distr. Madagascar, Himalaya, India, Ceylon, Malay Peninsula, C. & S. China, Formosa, Japan, Philippines, Malay Isls., and Polynesia

PARKERIACEAE (by Hirosi Ito)

Ceratopteris siliquosa (L.) Copel. in Philip. Journ. Sci. **56**: 107 (1935).

Acrostichum siliquosum L., Sp. Pl. ed. 1, **2**: 1070 (1753).

Ceratopteris thalictroides (L.) Brongn. in Bull. Soc. Philom. **1821**: 186 (1822)–Bedd.,Handb. 123 (1883)–Hope in Journ. Bombay Nat. Hist. Soc. **13**: 458 (1901).

Biratnagar, 200 m (Oct. 15, 1963); Mul Pokhari–Dumhan, 2400–700 m (Oct. 30, 30, 1963); Khebang–Bharomdin, 1700–1000 m (Nov. 24, 1963); Kathgara–Rangali, 200 m (Dec. 14, 1963).

Distr. In the tropics to warm temperate regions in the Old World.

DAVALLIACEAE (by Hirosi Ito)

Araiostegia dareiformis (Hook.) Copel. in Univ. Calif. Publ. Bot. **12**: 398 (1931).

Polypodium dareiforme Hook., 2nd Cent. Ferns t. 24 (1860).

Davallia dareiformis Levinge ex Clarke in Trans. Linn. Soc. ser. 2, **1**: 443 (1880).

Minchin Dhap–Mul Pokhari, 2800–2400 m (Oct. 29, 1963).

Distr. Himalaya (Nepal to Assam), Ceylon, Indo-China, and S. W. China.

Araiostegia perdurans (Christ) Copel. in Univ. Calif. Publ. Bot. **12**: 400 (1931).

Davallia perdurans Christ in Bull. Herb. Boiss. **6**: 970 (1898).

Ghatte–Khebang, 1600–1700 m (Nov. 19, 1963).

Distr. Himalaya (a new record), and W. China (Szechuan, Kweichow, Yunnan).

Araiostegia pulchra (D. Don) Copel. in Philip. Journ. Sci. **34**: 241 (1927)–Tagawa in Kitamura, Faun. & Fl. Nepal Himal. **1**: 79 (1955).

Davallia pulchra D. Don, Prodr. Fl. Nepal. 11 (1825)–Clarke in Trans. Linn. Soc. ser. 2. Bot. **1**: 444 (1880).

Leucostegia pulchra (D. Don) J. Sm. in London Journ. Bot. **1**: 426 (1842)–Bedd., Handb. 52 (1883).

Minchin Dhap–Mul Pokhari, 2800–2400 m (Oct. 29, 1963).

Distr. Himalaya, India, Ceylon, Indo-China, and W. China.

Davallia solida (Forst.) Sw. in Schrad. Journ. Bot. **1800** (2): 87 (1801)–Bedd., Handb. Ferns Brit. Ind. 59 (1883).

Trichomanes solidum Forst., Prodr. 86 (1786).

Pamianchi–Tingling Bridge, 2000–1000 m (May 15, 1960).

Distr. Himalaya, India, Malay Peninsula, Malay Isls., and Polynesia.

Davallia trichomanoides Bl., Enum. Pl. Jav. 238 (1828).

Takdah–Rayang, 1000 m (Apr. 20, 1960); Tingling Bridge, 1000 m (May 16, 1960); Gangtok–Saramsa Medicinal Garden, 800 m (Jun. 17, 1960); Tuwa–Taplethok, 1800–1300 m (Nov. 5, 1963).

Distr. India, Ceylon, Malay Peninsula, Malay Isls., and New Guinea.

Humata assamica (Bedd.) C. Chr. in Contr. U. S. Nation. Herb. **26**: 293 (1931).

Acrophorus assamicus Bedd., Ferns Brit. Ind. t. 94 (1866).

Davallia assamica (Bedd.) Bak., Syn. Fil. 452 (1868)–Clarke in Trans. Linn. Soc. ser. 2, **1**: 443 (1880).

Leucostegia assamica (Bedd.) J. Sm., Hist. Fil. 84 (1875)–Bedd., Handb. 51 (1883).

Observatory Hill, Darjeeling, 2100 m (Jun. 26, 1960); Minchin Dhap–Mul Pokhari, 2800–2400 m (Oct. 29, 1963)); Helok–Iladanda, 1500–1800 m (Nov. 8, 1963)); Selap–Walunchung Gola, 2600–3500 m (Nov. 10, 1963).

Distr. Himalaya, and W. China (Yunnan).

Leucostegia immersa (Wall.) Presl, Tent. Pterid. 95 (1836)–Bedd., Handb. 51 (1883).

Davallia immersa Wall., Cat. no. 256 (1828)–Hook., Sp. Fil. **1**: 156 (1846)–Clarke in Trans. Linn. Soc. ser. 2, **1**: 443 (1880)–Hope in Journ. Bombay Nat. Hist. Soc. **13**: 29 (1900).

Gangtok, 1000 m (Jun. 15, 1960); Ghum–Kurseong, 2000 m (Jun. 22, 1960); Phusri–Dhara Pani, 450–900 m (Oct. 16, 1963); Dhankuta–Murhay, 1200–2000 m (Oct. 23, 1963); Taplejung–Garhi Danra, 2000–2200 m (Nov. 3, 1963); Tuwa–Taplethok, 1800–1300 m (Nov. 5, 1963); Helok, 1500 m (Nov. 8, 1963); Helok–Iladanda, 1500–1800 m (Nov. 8, 1963); Yektin–Batasay, 1400–2400 m (Nov. 30, 1963); Batasay–Bhuspate Danra, 2400–2900 m (Dec. 1, 1963).

Distr. Himalaya, India, Indo-China, W. China (Kwangsi, Yunnan), Formosa, Malay Peninsula, Philippines, Malay Isls., and New Guinea.

Nephrolepis cordifolia (L.) Presl, Tent. Pterid. 79 (1836)–Bedd., Handb. 282 (1883)–Hope in Journ. Bombay Nat. Hist. Soc. **14**: 748 (1903)–Tagawa in Kitamura, Faun. & Fl. Nepal Himal. **1**: 79 (1955).

Polypodium cordifolium L., Sp. Pl. ed. 1, **2**: 1089 (1753).

Nephrolepis tuberosa Presl, Tent. Pterid. 79 (1836)–Bedd., Ferns S. Ind. 92 (1863).

Peshok, Darjeeling, 900 m (Apr. 27, 1960); Siliguri–Kurseong (Apr. 29, 1960; Dumhan–Taplejung, 700–2000 m (Nov. 1, 1963); below Siling Tzokupa–Khebang, 2100–1700 m (Nov. 22, 1963); Bharomdin–Tharpu, 1000–1200 m (Nov. 25, 1963).

Distr. Tropics and subtropics of the Old World.

Oleandra Wallichii (Hook.) Presl, Tent. Pterid. 78 (1836)–Bedd., Handb. 287 (1883)–Hope in Journ. Bombay Nat. Hist. Soc. **14**: 749 (1903).

Aspidium Wallichii Hook., Exot. Fl. t. 5 (1823).

Victoria Fall, Darjeeling, 1900 m (Apr. 3, 1960); Penlong La, Gangtok, 2100 m (Jun. 16, 1960); Phusri–Dhara Pani, 450–900 m (Oct. 16, 1963); Bilbatay Bhanjang–Hati Sar, 2200–2700 m (Oct. 27, 1963); Dhankuta–Murhay, 1200–2000 m (Oct. 23, 1963); Murhay, 2000 m (Oct. 23, 1963); Sinduwa, 2100 m (Oct. 23, 1963); Mul Pokhari–Dumhan, 2400–700 m (Oct. 30, 1963); Bhuspate Danra, 2900 m (Dec. 2, 1963).

Distr. Himalaya (Punjab to Assam), Burma, Indo-China, Malay Peninsula, W.. China (Szechuan, Yunnan), and Formosa.

PLAGIOGYRIACEAE (by Hirosi Ito)

Plagiogyria pycnophylla (Kunze) Mett., Farngat. Plag. 8 (1858)–Bedd., Handb. 129 (1883)–Nayar et Kazmi in Bull. Bot. Gard. Lucknow no. **64**: 28 (1962).

Lomaria pycnophylla Kunze in Bot. Zeit. **6**: 143 (1848).

Senchal, Darjeeling, 2400 m (Apr. 18, 1960); Batasi–Palmajua, 2300–2600 m (May 3, 1960); Garibans, 2800 m (Jun. 7, 1960); Tendong Peak, 2700 m (Mar. 26, 1963); Hati Sar–Minchin Dhap, 2700–2800 m (Oct. 28, 1963); Minchin Dhap–Mul Pokhari, 2800–2400 m (Oct. 29, 1963); Selap–Walunchung Gola, 2600–3500 m (Nov. 10, 1963); Baroya Khimty, 2500 m (Nov. 11, 1963); Thakma Khola–Bhandukay, 3200–2400 m (Nov. 14, 1963); below Siling Tzokupa–Siling Tzokupa, 2100–3800 m (Nov. 21, 1963); Bhuspate Danra, 2600 m (Dec. 2, 1963).

Distr. Himalaya, Malay Peninsula, Philippines, and Malay Isls.

CYATHEACEAE (by Motozi Tagawa)

Cyathea Brunoniana (Hook.) Clarke et Baker in Journ. Linn. Soc. **24**: 409 (1888)–Holtt. in Kew Bull. **19**: 486 (1965).

Alsophila Brunoniana Hook., Sp. Fil. **1**: 52 (1844)–Bedd., Ferns Brit. India t. 86 (1865).

Gangtok, 1700 m (Jun. 15, 1960).

Distr. Himalaya, E. Burma, and Tonkin.

Cyathea gigantea (Wall. ex Hook.) Holtt. in Gard. Bull. S. S. **8**: 318 (1935); Kew Bull. **19**: 476 (1965).

Alsophila gigantea Wall. ex Hook., Sp. Fil. **1**: 53 (1844).

Ranga Pani–Ghorwa, 700–300 m (Dec. 9, 1963).

Distr. India and S. W. China to W. Malaysia.

Cyathea spinulosa Wall. ex Hook., Sp. Fil. **1**: 25 (1844)–Bedd., Ferns S. India t. 57 (1863); Handb. Ferns Brit. India 6 (1883)–Holtt. in Kew Bull. **19**: 471 (1965).

Garhi Danra–Tuwa, 2200–1800 m (Nov. 4, 1963).

Distr. E. Himalaya to N. Thai, and to S. Japan.

ASPIDIACEAE (by Hirosi Ito, Motozi Tagawa & Kunio Iwatsuki)*

Acrophorus stipellatus (Wall.) Moore in Gard. Chron. **1854**: 135 (1854)–Nayar & Kaur in Bull. Bot. Gard. Lucknow no. **81**: 34 (1963).

Davallia stipellata Wall., Cat. no. 260 (1828).

Senchal–Takdah, 2000–1600 m (Apr. 17, 1960); Rimbick–Ramam, 1900–2400m (May 7, 1960); Walunchung Gola–Zongi, 3500–2600 m (Nov. 11, 1963); Baroya Khimty–Thakma Khola, 2500–3300 m (Nov. 16, 1963); Thakma Khola–Yamphodin,

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* *Acrophorus*, *Arachniodes*, *Bolbitis*, *Cyrtomium*, *Cystopteris*, *Diacalpe*, *Dryopteris*, *Elaphoglossum*, *Lomariopsis*, *Peranema*, *Tectaria*, and *Woodsia* were identified by H. Ito; *Athyrium*, *Bolbitis*, *Cornopteris*, *Diplaziopsis*, *Diplazium*, *Dryoathyrium*, and *Polystichum* by M. Tagawa; and *Meniscium* and *Thelypteris* by K. Iwatsuki.

3300–2100 m (Nov. 17, 1963); Birwa–Yektin, 2400–1700 m (Nov. 28, 1963).

Distr. Himalaya, Indo-China, S. W. China, Formosa, Ryukyu, Japan (Isl. Yakusima), Philippines, Java, and Fiji.

Arachniodes assamica (Kuhn) Ohwi in Journ. Jap. Bot. **37**: 76 (1962).

Aspidium assamicum Kuhn in Linnaea **36**: 108 (1869).

Rumohra assamica (Kuhn) Ching in Sinensia **5**: 47, t. 4–6 (1934).

Batasi, Darjeeling, 2000 m (May 2, 1960).

Distr. Himalaya, Assam, Burma, W. China, and Japan.

Arachniodes spectabilis (Ching) H. Ito, comb. nov.

Rumohra spectabilis Ching in Sinensia **5**: 58, t. 11 (1934).

Batasi–Palmajua, 2100–2300 m (May 3, 1960); Palmajua–Rimbick, 2300–2200 m (May 5, 1960); Rimbick, 2200 m (May 5, 1960); Yoksam–Bakkim, 1700–2200 m (May 18, 1960); Sinduwa, 2100 m (Oct. 23, 1963); Iladanda–Selap, 1800–2600 m (Nov. 9, 1963); Zongi–Iladanda, 2600–1800m (Nov. 12, 1963); Ghatte–Khebang, 1600–1700m (Nov. 19, 1963); Khebang–below Siling Tzokupa, 1700–2100m (Nov. 20, 2963); Mai Majuwa–Dhara Pani, 1600–1500 m (Dec. 4, 1963).

Distr. Himalaya (a new record), and W. China (Yunnan).

Athyrium Atkinsoni Bedd., Ferns Brit. Ind. Suppl. 11, pl. 359 (1876)–C. Chr. in Contr. U. S. Nation. Herb. **26**: 300 (1931).

Bilbatay Bhanjang, 2000 m (Oct. 26, 1963); Hati Sar–Minchin Dhap, 2500–2800 m (Oct. 28, 1963); Walunchung Gola–Zongi, 2700–3200 m (Nov. 11, 1963); Thakma Khola–Yamphodin, 2000–3500 m (Nov. 17, 1963).

Distr. Himalaya through China and Formosa, to Japan.

Athyrium drepanopterum (Kunze) A. Br. ex Milde, Fil. Eur. Atl. 49 (1867).

Polypodium drepanopterum Kunze in Linnaea **23**: 278, 318 (1850).

Asplenium oxyphyllum Hook., Sp. Fil. **3**: 221 (1860).

Dhankuta, 1200 m (Oct. 19, 1963); Hati Sar–Minchin Dhap, 2500–3000 m (Oct. 28, 1963); Taplejung, 1700 m (Nov. 2, 1963); Garhi Danra–Tuwa, 1500–2000 m (Nov. 4, 1963); Yamphodin–Ghatte, 2000–2500 m (Nov. 18, 1963); Tharpu–near Chyangthaphu, 1100 m (Nov. 26, 1963).

Distr. Himalaya, Burma, W. China (Yunnan), Formosa, and Luzon.

Athyrium foliolosum Moore apud Bedd., Handb. Suppl. 37 (1892).

Hati Sar–Minchin Dhap, 2500–3000 m (Oct. 28, 1963); Minchin Dhap–Mul Pokhari, 2800–2500 m (Oct. 29, 1963); Helok–Iladanda, 1500–2000 m (Nov. 8 & 13, 1963).

Distr. Himalaya and W. China (Yunnan), perhaps to Formosa.

Athyrium macrocarpon (Blume) Bedd., Ferns S. Ind. 51, t. 153 (1864)–Sledge in Bull. Brit. Mus. Bot. **2**: 288 (1962).

Aspidium macrocarpon Blume, Enum. Pl. Jav. **2**: 162 (1828).

Athyrium anisopterum Christ in Bull. Herb. Boiss. **6**: 962 (1898)–Sledge, l.c. 289 (1962).

Sinduwa, 2100 m (Oct. 23 & 24, 1963); Bilbatay Bhanjang, 2000–2200 m (Oct. 25 & 26, 1963); Hati Sar–Minchin Dhap, 2500–3000m (Oct. 28, 1963); Mul Pokhari–Nissim, 2200 m (Oct. 30, 1963); Dumhan–Taplejung, 1000–1500m (Nov. 1, 1963); Taplejung, 1700m (Nov. 2,1963); Helok–Iladanda, 1500–2000 m (Nov. 8, 1963); Yamphodin–Ghatte, ca. 2000 m (Nov. 18, 1963); Khebang–Siling Tzokupa (Nov. 20, 1963); Garhi Danra–Tuwa, 1500–2000 m (Nov. 14, 1963); below Siling Tzokupa–Siling Tzokupa, 2000–3000 m (Nov. 21, 1963); Tharpu–near Chyangthaphu, 1000 m (Nov. 26, 1963); Birwa–Yektin, 1300–2200 m (Nov. 28, 1963); Bhuspate Danra–Mai Majuwa, 1500–3000 m (Dec. 3, 1963).

Distr. India, Tonkin, S. China, and Formosa, also in Luzon, Java, and Borneo.

Athyrium nigripes (Blume) Moore, Ind. Fil. xlix (1856), 98 (1858)–Sledge in Ann. et Mag. Nat. Hist. ser. 12, **9**: 454 (1956).

Asplenium nigripes Blume, Enum. Pl. Jav. **2**: 162 (1828).

Murhay, 2000 m (Oct. 23, 1963); Iladanda–Selap, 1500–2500 m (Nov. 9, 1963); Mai Majuwa–Dhara Pani (Dec. 4, 1963).

Distr. Himalaya to Java.

The name is here adopted in the usual but perhaps incorrect usage.

Athyrium pectinatum (Wall. ex Mett.) Bedd., Handb. Ferns Brit. Ind. Suppl. 36 (1892).

Asplenium pectinatum Wall. ex Mett. in Abh. Senckenb. Naturforsch. Ges. **3**: 241 (1860)–Hope in Journ. Bombay Nat. Hist. Soc. **14**: 253 (1902).

Kathmandu Airport, 1400 m (Oct. 13, 1963); Phusri–Dhra Pani, 500–1000 m (Oct. 16, 1963); Dhankuta–Hilay (Oct. 23, 1963); Tuwa–Taplethok, 1500 m (Nov. 5, 1963); Taplethok–Helok, 1500 m (Nov. 6, 1963); Helok–Iladanda, 1500–2000 m (Nov. 8, 1963).

Distr. Himalaya, and India.

Athyrium strigillosum Moore in Lowe, Ferns Brit. Exot. **5**: pl. 36 (1858)–C. Chr. in Contr. U.S. Nat. Herb. **26**: 299 (1931).

Athyrium Clarkei Bedd., Ferns Brit. Ind. Suppl. 11, pl. 360 (1876).

Asplenium Clarkei Atkinson ex Clarke in Trans. Linn. Soc. **2**: 489 (1880).

Asplenium tenuifrons Wall. ex Hope in Journ. Bombay Nat. Hist. Soc. **14**: 120, pl. 22 (1902).

Mai Majuwa–Dhara Pani, 1500–2000 m (Dec. 4, 1963).

Distr. Himalaya to N. Burma, and W. China (Yunnan).

Bolbitis costata (Wall. ex Hook.) Ching in C. Chr., Ind. Fil. Suppl. **3**: 47 (1934).

Acrostichum costatum Wall. ex Hook., Sp. Fil. **5**: 262 (1864).

Gymnopteris costata (Hook.) Bedd., Ferns Brit. Ind. Suppl. 27 (1876).

Campium costatum (Hook.) Presl ex Copel. in Philip. Journ. Sci. **37**: 386 (1928).

Ghorwa–Sanichare, 300–200 m (Dec. 10, 1963).

Distr. Himalaya to Thai.

Bolbitis heteroclita (Presl) Ching in C. Chr., Ind. Fil. Suppl. **3**: 48 (1934); Icon. Fil. Sin. **3**: t. 119 (1935)–Nayar et Kaur in Bull. Bot. Gard. Lucknow no. **88**: 43, f. 87 (1964).

Acrostichum heteroclitum Presl, Rel. Haenk. **1**: 15, t. 2 (1825).

Rayang, Darjeeling, 250 m (Apr. 21, 1960); Ghorwa–Sanichare, 300–200 m (Dec. 10, 1963).

Distr. E. Himalaya (Nepal to Assam), Burma, Malay Peninsula, S. W. China, Philippines, Malay Isls., Polynesia, and Micronesia.

Bolbitis sinensis (Baker) K. Iwats. in Act. Phytotax. Geobot. **18**: 49 (1959).

Polybotrya appendiculata var. *ludens* Bedd., Ferns Brit. Ind. Suppl. 26 (1876).

Acrostichum sinense Baker in Kew Bull. **1906**: 14 (1906).

Egenolfia sinensis (Baker) Maxon in Proc. Biol. Soc. Wash. **36**: 173 (1923)-Ching in Bull. Fan Mem. Inst. Biol. **2**: 305 (1931).

Illam-Ranga Pani, 700 m (Dec. 8, 1963).

Distr. Himalaya, Thai, Tonkin, and S. China.

Bolbitis virens (Wall.) Schott, Gen. Fil. ad t. 14 (1834)-Nayar et Kaur, l.c. 71 (1964).

Acrostichum virens Wall., Cat. no. 1033 (1828)-Hook. et Grev., Icon. Fil. t. 221 (1831)-Hope in Journ. Bombay Nat. Hist. Soc. **15**: 103 (1903).

Ghorwa-Sanichare, 300-200 m (Dec. 10, 1963).

Distr. Himalaya, Burma, Thai, and Java.

Cornopteris opaca (D. Don) Tagawa in Act. Phytotax. Geobot. **8**: 92 (1939), p.p.

Hemionitis opaca D. Don, Prodr. Fl. Nepal. 13 (1825).

Leptogramma opaca (D. Don) Bedd., Handb. 379 (1883).

Mani Bhanjang-Batasi, 2000-2600 m (May 1, 1960).

Distr. Himalaya, to S. Japan.

Cyrtomium Hookerianum (Presl) C. Chr., Ind. Fil. Suppl. **1**: 101 (1913)-Ching in Bull. Chin. Bot. Soc. **2**: 91 (1936).

Lastrea Hookeriana Presl, Tent. Pterid. 77 (1836).

Takdah, Darjeeling, 1600-1700 m (Apr. 19, 1960); Palmajua, 2300 m (May 4, 1960); Palmajua-Rimbick, 2300-2200 m (May 5, 1960); Mai Majuwa-Dhara Pani, 1600-1500 m (Dec. 4, 1963).

Distr. Himalaya, Tonkin, W. China, and Formosa.

Cystopteris tenuisecta (Bl.) Mett. in Ann. Mus. Bot. Lugd.-Bat. **1**: 241 (1864).

Aspidium tenuisectum Bl., Enum. Pl. Jav. 170 (1828).

Zongi-Iladanda, 2000 m (Nov. 12, 1963).

Distr. Himalaya, Tonkin, W. China (Yunnan), Formosa, Japan (Isl. Yakusima), and Malay Isls.

Diacalpe aspidioides Bl., Enum. Pl. Jav. 241 (1828)-Bedd., Handb. 18 (1883).

Peranema aspidioides (Bl.) Mett., Fil. Lechl. **2**: 33 (1859)-Nayar et Kaur in Bull. Bot. Gard. Lucknow no. **81**: 22 (1963).

Rimbick-Ramam, 1900-2400 m (May 7, 1960); Yoksam-Bakkim, 1700-2500 m (May 18, 1960); Helok-Baroya Khimty, 1500-2500 m (Nov. 10, 1963); Thakma Khola-Yamphodin, 3300-2100 m (Nov. 17, 1963); Bhuspate Danra-Mai Majuwa, 2900-1600 m (Dec. 3, 1963).

Distr. Himalaya, India, Ceylon, S. W. China, Hainan, Malay Isls., Philippines, and New Guinea.

Diplaziopsis javanica (Blume) C. Chr., Ind. Fil. 227 (1905)-Sledge in Bull. Brit. Mus. **2**: 317 (1962)-Ching in Act. Phytotax. Sin. **9**: 32 (1964).

Asplenium javanicum Blume, Enum. Pl. Jav. 175 (1828).

Allantodia javanica (Blume) Trevis. in Nuov. Giorn. Bot. Ital. **7**: 159 (1875)-Bedd., Handb. 195 (1883).

Rimbick, 2200 m (May 5, 1960); Ghatte-Khebang, 2000 m (Nov. 19, 1963); Mai Majuwa-Dhara Pani 1900-1500 m (Dec. 4, 1963).

Distr. Himalaya to S. China, and Formosa, southward through Ceylon, Malaysia to S. Pacific Islands.

Diplazium bellum (Clarke) Tagawa, comb. nov.

Asplenium bellum Clarke in Trans. Linn. Soc. **1**: 496 (1880).

Athyrium bellum (Clarke) Ching in C. Chr., Ind. Fil. Suppl. **3**: 40 (1934).

Allantodia bella (Clarke) Ching in Act. Phytotax. Sin. **9**: 48 (1964).

Illam-Ranga Pani, 500-1000 m (Dec. 8, 1963).

Distr. Himalaya, and S. Tibet.

Diplazium esculentum (Retz.) Sw. ex Schrad. in Journ. Bot. **1800**: 312 (1803)-Sledge in Bull. Brit. Mus. Bot. **2**: 310 (1962).

Anisogonium esculentum (Retz.) Presl, Tent. Pterid. 116 (1836)-Bedd., Handb. 192 (1883).

Gangtok, 1600 m (Jun. 15, 1960); Biratnagar, 200 m (Oct. 14, 1963); Dumhan-Taplejung, 1500 m (Nov. 1, 1963); Khebang-Bharomdin, 1000-1500 m (Nov. 24, 1963); Bharomdin-Tharpu, 500-1000 m (Nov. 25, 1963); Illam-Ranga Pani, 1000-500 m (Dec. 8, 1963); Mahara Bahara-Kathgara, 200 m (Dec. 13, 1963).

Distr. Tropical and subtropical Asia, through Malaysia to Samoa.

Diplazium giganteum (Bak.) Ching in C. Chr., Ind. Fil. Suppl. **3**: 73 (1934).

Gymnogramme gigantea Bak. in Journ. Bot. **27**: 177 (1889).

Allantodia gigantea (Bak.) Ching in Act. Phytotax. Sin. **9**: 55 (1964).

Pamianchi, Sikkim, 2000 m (May 13, 1960).

Distr. Himalaya to C. China.

Diplazium heterophlebium (Mett. ex Hook. et Bak.) Diels in Engl., Pfl.-fam. I, **4**: 228 (1899).

Asplenium heterophlebium Mett. ex Hook. et Bak., Syn. Fil. 243 (1867).

Anisogonium heterophlebium (Mett. ex Hook. et Bak.) Bedd., Ferns Brit. Ind. t. 329 (1869); Handb. 191 (1883).

Dictyodroma heterophlebium (Mett. ex Hook. et Bak.) Ching in Act. Phytotax. Sin. **9**: 59 (1964).

Takdah, Darjeeling, 1600-1700 m (Apr. 19, 1960).

Distr. Himalaya to S. W. China, south to Malaya.

Diplazium japonicum (Thunb.) Bedd., Ferns Brit. Ind. Suppl. 12 (1876); Handb. 180 (1883).

Asplenium japonicum Thunb., Fl. Jap. 334 (1784).

Athyriopsis japonica (Thunb.) Ching in Act. Phytotax. Sin. **9**: 65 (1964).

Darjeeling, 2000 m (Jun. 24, 1960); Taplejung, 1700 m (Oct. 2, 1963); Kathmandu Airport, 1400 m (Oct. 13, 1963); Tuwa-Taplethok, 1500 m (Nov. 5, 1963).

Distr. Himalaya, India to Japan, south to Malaysia.

The name here adopted is in the usual broad sense. Refer to Sledge's account on *D. lasiopteris* Kunze (in Bull. Brit. Mus. Bot. **2**: 296 (1962)).

Diplazium muricatum (Mett.) v. Ald. v. Rosenb., Mal. Ferns 829 (1909)-Sledge in Bull. Brit. Mus. Bot. **2**: 312 (1962), synonyms fully quoted.

Asplenium muricatum Mett. in Ann. Mus. Bot. Lugd-Bat. **2**: 239 (1866).

Yoksam-Bakkim, 1700-2200 m (May 18, 1960). Helok-Iladanda, 1500-2000 m (Nov. 8, 1963); Bhuspate Danra-Mai Majuwa, 2000-2500 m (Dec. 3, 1963); Mai Majuwa-Dhara Pani (Dec. 4, 1963).

Distr. Himalaya to S. W. China, Formosa, south to Java and Ceylon.

Diplazium spectabile (Wall. ex Mett.) Ching in Lingn. Sci. Journ. **15**: 278 (1936).

Asplenium spectabile Wall. ex Mett. in Abh. Senckenb. Naturforsch. Ges. **3**: 196 (1859).

Diplazium umbrosum var. *multicaudatum* (Wall. ex Clarke) Bedd., Handb. 190 (1883).

Allantodea spectabilis (Wall. ex Mett.) Ching in Act. Phytotax. Sin. **9**: 48 (1964).

Lopchu, 1500 m (Apr. 28, 1960).

Distr. Himalaya to W. China (Yunnan).

Diplazium Stoliczkae Bedd., Ferns Brit. Ind. Suppl. 13, t. 361 (1876).

Victoria Fall, Darjeeling, 1900 m (Apr. 3, 1960); Bilbatay Bhanjang, 2200 m (Oct. 26, 1963).

Distr. Himalaya.

Dryoathyrium Boryanum (Willd.) Ching in Bull. Fan Mem. Inst. Biol. **11**: 81 (1941)–Sledge in Bull. Brit. Mus. Bot. **2**: 282 (1962).

Aspidium Boryanum Willd. in L., Sp. Pl. ed. 4, **5**: 285 (1810).

Lastrea Boryana (Willd.) Moore, Ind. Fil. 86 (1858)–Bedd., Handb. 266 (1883).

Parathyrium Boryanum (Willd.) Holtt. in Kew Bull. **13**: 449 (1959).

Helok–Iladanda, 1500–2000 m (Nov. 8, 1963); Ghatte–Khebang, 1500–2000 m (Nov. 19, 1963); Tharup–near Chyangthaphu, 1000–1500 m (Nov. 26, 1963).

Distr. East Africa to tropical Asia generally.

Dryopteris apiciflora (Wall.) O. Kuntze, Rev. Gen. Pl. **2**: 812 (1891).

Aspidium apiciflorum Wall., Cat. no. 345 (1828)–Mett., Pheg. u. Asp. 54, n. 128 (1858).

Lastrea apiciflora (Wall.) Presl, Tent. Pterid. 76 (1836)–Bedd., Handb. 249 (1883).

Tendong Peak, Sikkim, 2700 m (Mar. 26, 1963); Mul Pokhari–Dumhan, 2400–700 m (Oct. 30, 1963); Birwa–Yektin, 2400–1700 m (Nov. 28, 1963).

Distr. Himalaya, and Formosa.

Dryopteris atrata (Wall.) Ching in Sinensia **3**: 326 (1933).

Aspidium atratum Wall., Cat. no. 380 (1828)–Kunze in Linnaea **24**: 279 (1851).

Lastrea hirtipes (Bl.) sensu Bedd., Handb. 232 (1883).

Batasi–Palmajua, 2300–2600 m (May 3, 1960); Palmajua–Rimbick, 2300–2200 m (May 5, 1960); Yoksam–Bakkim, 1700–2200 m (May 18, 1960); Gangtok Orchid Sanctuary (Mar. 18, 1963); Garhi Danra–Tuwa, 2200–1800 m (Nov. 4, 1963); Iladanda –Selap, 1800–2600 m (Nov. 9, 1963).

Distr. Himalaya, Ceylon, Burma, China, Formosa, and Japan.

Dryopteris barbigera (Hook.) O. Kuntze, Rev. Gen. Pl. **2**: 812 (1891)–Tagawa in Kitamura, Faun. & Fl. Nepal Himal. **1**: 80 (1955)–Stewart in Biologia **3** (2): 7 (1957).

Nephrodium barbigerum Hook., Sp. Fil. **4**: 113 (1862)–Hope in Journ. Bombay Nat. Hist. Soc. **14**: 732 (1903).

Lastrea barbigera Moore ex Bedd., Ferns Brit. Ind. t. 227 (1867)-Handb. 246 (1883).

Sandakphu–Garibans, 3000–2800 m (Jun. 7, 1960); Gangtok, 1600 m (Jun. 15, 1960); Birch Hill, Darjeeling, 2000 m (Jun. 18, 1960).

Distr. Afghanistan, Himalaya (Kashmir to Sikkim), W. China (Yunnan), and Formosa.

Dryopteris chrysocoma (Christ) C. Chr., Ind. Fil. 257 (1905)-Stewart in Biologia **3** (2): 5 (1957).

Aspidium chrysocoma Christ in Bull. Acad. Géogr. Bot. **11**: 253 (1902).

Rimbick, Darjeeling, 2200 m (May 5, 1960); Gangtok, 1600 m (Jun. 15, 1960).

Distr. Himalaya, and C. China.

Dryopteris cochleata (D. Don) C. Chr., Ind. Fil. 258 (1905).

Nephrodium cochleatum D. Don, Prodr. Fl. Nepal. 6 (1825)–Clarke in Trans. Linn. Soc. ser. 2, **1**: 521 (1880)–Hope in Journ. Bombay Nat. Hist. Soc. **14**: 734 (1903).

Lastrea filix mas Presl var. *δ. cochleata* (Don) Bedd., Handb. 250 (1883).

Kathmandu Airport, 1400 m (Oct. 13, 1963); Dhankuta, 1200 m (Oct. 18, 19 & 20, 1963); Bilbatay Bhanjang, 2200 m (Oct. 25, 1963); below Siling Tzokupa–Khebang, 2100–1700 m (Nov. 22, 1963); Ranga Pani–Ghorwa, 700–300 m (Dec. 9, 1963).

Distr. Himalaya, India, Burma, Malay Peninsula, and China.

Dryopteris costalisora Tagawa in Act. Phytotax. Geobot. **3**: 88 (1934).

Birch Hill, Darjeeling, 2000 m (Apr. 7, 1960); Lopchu, Darjeeling, 1500 m (Apr. 28, 1960); Batasi, 2000 m (May 2, 1960); Mai Majuwa–Dhara Pani, 1600–1500 m (Dec. 4, 1963).

Distr. Himalaya (a new record), and Formosa.

Dryopteris Harae H. Ito, sp. nov. [Pl. 26]

Rhizoma crassum, paleis aureo-fuscis anguste linearibus ca. 20 mm longis densissime vestitum. Stipites fasciculati firmi 45–53 cm longi 2–4 mm crassi straminei, basi paleis retrorsis aureo-fuscis vel brunneis lineari-lanceolatis 10–20 mm longis dense vestitis, ceteris paleis adpressis nigrobrunneis lineari-lanceolatis 2–10 mm longis dense sed deciduis vestitis. Laminae frondum chartaceo-coriaceae lucidae late ovatae 60 cm longae 50 cm latae, tripinnatae, rhachidibus stramineis paleis nigrobrunneis lanceolatis vel lineari-lanceolatis 2–4 mm longis dense vestitis, pinnis inferioribus majoribus approximatis leviter ca. 8 jugis et superioribus gradatim bervioribus, pinnis infimis maximis 40 cm longis 20 cm latis late lanceolatis acuminatis leviter falcatis stipitibus 2 cm longis, pinnulis 10–12 jugis, infimis maximis lanceolatis breviter stipitatis pinnatis, pinnulis secundariis obliquiter rhomboidei-ovatis basi cuneatis apice acutis pinnatipartitis vel pinnatilobatis, segmentis oblongis apice rotundatis integris vel tenuiter crenatis, costis et costulis infra paleis adpressis minutis ovatis vel ovato-lanceolatis nigrobrunneis et paleis filiformibus ctenitoideis brunneis vestitis, venis simpliciter pinnatis, venulis 1–3 furcatis ad margines non attingentibus. Sori rotundi per omnis segmenta biseriales apud costulas vel venas siti, indusiis dryopteridoideis rotundi-reniformibus in mediis ca. 1 mm longis margine integris. Sporangia annulibus a 12–13 cellulis constitutis, sporis reniforme ellipsoideis tuberculatis.

Typus. Sikkim: Yoksam–Bakkim, 1700–2200 m (Hara, Kanai, Murata, Togashi, & Tuyama, May 18, 1960) in TI.

Victoria Fall, Darjeeling, 1900 m (Apr. 2 & 3, 1960); Batasi-Palmajua, 2300-2600 m (May 3, 1960).

Distr. Himalaya (endemic).

This species is near *D. Hendersoni* C. Chr., but differs from it by the thinner frond, the broader and once more pinnate pinnules, and the narrower golden brown scales of the stipe base. The specific epithet is dedicated to Prof. H. Hara who was the leader of the expedition.

Dryopteris Hasseltii (Bl.) C. Chr., Ind. Fil. 269 (1905).

Polypodium Hasseltii Bl., Fl. Jav. Fil. 195, t. 92 (1829).

Polystichopsis Hasseltii (Bl.) Holtt., Fl. Malaya **2**: 487 (1954).

Minchin Dhap-Mul Pokhari, 2800-2400 m (Oct. 29, 1963).

Distr. E. Himalaya (Nepal to Assam), Tonkin, Hainan, Formosa, Ryukyu, Philippines, Malay Isls., and New Guinea.

Dryopteris hypophlebia Hayata, Icon. Pl. Formos. **4**: 154, f. 96 (1914).

Walunchung Gola-Zongi, 3500-2600 m (Nov. 11, 1963).

Distr. Himalaya (a new record), and Formosa.

Dryopteris Kawakamii Hayata, Mater. Fl. Formos. 416 (1911); Icon. Pl. Formos. **4**: 155, f. 96 (1914).

Baroya Khimty-Thakma Khola, 2500-3300 m (Nov. 16, 1963); below Siling Tzokupa-Siling Tzopuka, 2100-3800 m (Nov. 21, 1963).

Distr. Himalaya (a new record) and Formosa.

Dryopteris lepidopoda Hayata, Icon. Pl. Formos. **4**: 161, f. 101 (1914).

Lopchu, Darjeeling, 1600 m (Apr. 28, 1960); Murhay, 2000 m (Oct. 23, 1963); Helok-Iladanda, 1500-1800 m (Nov. 8, 1963); Iladanda-Selap, 1800-2600 m (Nov. 9, 1963); Baroya Khimty-Thakma Khola, 2500-3300 m (Nov. 16, 1963).

Distr. Himalaya (a new record) and Formosa.

Dryopteris marginata (Wall.) Christ in Philip. Journ. Sci. **2**: 212 (1907)-Stewart in Biologia **3** (2): 7 (1957).

Aspidium marginatum Wall., Cat. no. 391 (1828).

Nephrodium marginatum (Wall.) Hope in Journ. Bombay Nat. Hist. Soc. **14**: 740 (1903).

Dhankuta-Sinduwa, 1200-2100 m (Oct. 22, 1963); Sinduwa, 2100 m (Oct. 23 & 24, 1963); Bilbatay Bhanjang, 2200 m (Oct. 25 & 26, 1963); Hati Sar-Minchin Dhap, 2700-2800 m (Oct.28, 1963); Minchin Dhap-Mul Pokhari, 2800-2400m (Oct. 29, 1963).

Distr. Himalaya, India, Ceylon, Malay Peninsula, and Formosa.

Dryopteris odontoloma (Moore) C. Chr. in Act. Hort. Gothob. **1**: 59 (1924)-Stewart in Biologia **3** (2): 6 (1957).

Lastrea odontoloma Moore, Ind. Fil. 90 (1858).

Nephrodium odontoloma (Moore) Hope in Journ. Bombay Nat. Hist. Soc. **14**: 736 (1903).

Kurseong, Darjeeling, 1000 m (Apr. 12, 1960).

Distr. Afghanistan, Himalaya, India, Indo-China, Tibet, and S. W. China.

Dryopteris paleacea (Sw.) C. Chr. in Amer. Fern Journ. **1**: 94 (1911)-Stewart in Biologia **3** (2): 6 (1957).

Aspidium paleaceum Sw., Syn. Fil. 52 (1806).

Yoksam-Bakkim, 1700-2200 m (May 18, 1960); Sinduwa, 2100 m (Oct. 24, 1963);

Bilbatay Bhanjang, 2200 m (Oct. 24, 1963); Bilbatay Bhanjang-Hati Sar, 2200-2700 m (Oct. 27, 1963); Hati Sar-Minchin Dhap, 2700-2800 m (Oct. 28, 1963); Taplethok-Helok, 1300-1500 m (Nov. 6, 1963); Iladanda-Selap, 1800-2600 m (Nov. 9, 1963); Helok-Baroya Khimty, 1500-2500 m (Nov. 10, 1963); Selap-Walunchung Gola, 2600-3500 m (Nov. 10, 1963)*; Baroya Khimty-Thakma Khola, 2500-3300 m (Nov. 16, 1963); Thakma Khola-Yamphodin, 3300-2100 m (Nov. 17, 1963); Birwa-Yektin, 2400-1700 m (Nov. 28, 1963); Yektin-Batasay, 1400-2400 m (Nov. 30, 1963); Batasay-Bhuspate Danra, 2400-2900 m (Dec. 1, 1963).

Distr. Himalaya, India, S. China, Formosa, Philippines, Malay Isls., New Guinea, and many other tropical regions of the world.

This species has much variations in the shape of frond, the number of pinnae, the color and texture of scales, and so on. The specimen from Selap-Walunchung Gola marked as * above, is an extreme one.

Dryopteris panda (Clarke) C. Chr., Ind. Fil. Suppl. **3**: 94 (1934).

Nephrodium filix-mas Rich. var. *pandum* Clarke in Trans. Linn. Soc. ser 2, **1**: 519 (1880).

Lastrea filix mas Presl var. *panda* (Clarke) Bedd., Handb. 251 (1883).

N. pandum (Clarke) Hope in Journ. Bombay Nat. Hist. Soc. **12**: 623 (1899).

Sinduwa, 2100 m (Oct. 23 & 24, 1963); Tuwa-Taplethok, 1800-1300 m (Nov. 5, 1963); Taplethok-Helok, 1300-1500 m (Nov. 6, 1963); Iladanda-Selap, 1800-2600 m (Nov. 9, 1963).

Distr. Himalaya, N. China, and Korea.

Dryopteris reflexosquamata Hayata, Icon. Pl. Formos. **4**: 176, f. 114 (1914).

Senchal, Darjeeling, 2300 m (Apr. 6, 1960); Garibans-Tonglu, 2800-3000 m (Jun. 7, 1960); Senchal-Tiger Hill, 2400-2500 m (Jun. 23, 1960); Minchin Dhap-Mul Pokhari, 2800-2400 m (Oct. 29, 1963); Selap-Walunchung Gola, 2600-3500 m (Nov. 10, 1963); Zongi-Iladanda, 2600-1800 m (Nov. 12, 1963); Baroya Khimty-Thakma Khola, 2500-3300 m (Nov. 16, 1963).

Distr. Himalaya (a new record), and Formosa.

Dryopteris serrato-dentata (Bedd.) Hayata, Icon. Pl. Formos. **4**: 179, f. 116 (1914)-Stewart in Biologia **3** (2): 8 (1957).

Lastrea filix-mas Presl var. *serrato-dentata* Bedd., Handb. Suppl. 55 (1892).

Nephrodium serrato-dentatum (Bedd.) Hope in Journ. Bombay Nat. Hist. Soc. **12**: 622 (1899).

Gamothang, 3900 m (May 29, 1960); Phalut, 3500 m (Jun. 5, 1960).

Distr. Himalaya, Tibet, W. China, and Formosa.

Dryopteris sparsa (D. Don) O. Kuntze, Rev. Gen. Pl. **2**: 813 (1891).

Nephrodium sparsum D. Don, Prodr. Fl. Nepal. 6 (1825)-Hope in Journ. Bombay Nat. Hist. Soc. **14**: 743 (1903).

Lastrea sparsa (D. Don) Moore, Ind. Fil. 87, 104 (1858)-Bedd., Handb. 252 (1883).

Takdah, Darjeeling, 1600 m (Apr. 20, 1960); Peshok, Darjeeling, 900 m (Apr. 27, 1960); Lopchu, 1500 m (Apr. 29, 1960); Pouwa, Kathmandu, 1600 m (Oct. 9, 1963); Kathmandu Airport, 1400 m (Oct. 13, 1963); Taplethok-Helok, 1300-1500 m (Nov. 6, 1963); Helok-Iladanda, 1500-1800 m (Nov. 8, 1963); Thakma Khola-Bhandukay, 3200-2400 m (Nov. 14, 1963); Ghatte-Khebang, 1600-1700 m (Nov. 19, 1963).

Distr. Himalaya India, Ceylon, Burma, Malay Peninsula, Tibet, China, Formosa, Japan, Philippines, Malay Isls., and New Guinea.

Dryopteris squamiseta (Hook.) O. Kuntze, Rev. Gen. Pl. **2**: 813 (1891).

Nephrodium squamisetum Hook., Sp. Fil. **4**: 140, t. 263 (1862).

Palmajua–Rimbick, 2300–2200 m (May 5, 1960); Rimbick–Ramam, 1900–2400 m (May 7, 1960).

Distr. Africa, and Himalaya (a new record).

Dryopteris yunnanensis (Christ) Copel., Gen. Fil. 122 (1947).

Aspidium yunnanense Christ in Bull. Herb. Boiss. **6**: 965 (1898).

Below Siling Tzokupa–Khebang, 2100–1700 m (Nov. 22, 1963); Tharpu–near Chyangthaphu, 1200–1100 m (Nov. 26, 1963); Yektin, 1100 m (Nov. 29, 1963).

Distr. Himalaya (a new record), and W. China (Yunnan).

Elaphoglossum conforme (Sw.) Schott, Gen. Fil. ad t. 14 (1834)–Bedd., Handb. 416 (1883).

Acrostichum conforme Sw., Syn. Fil. 10, 192, t. 1, f. 1 (1806).

Ramam–Phalut, 2400–3500m (May 9, 1960); Chia Bhanjang–Dentam, 2000–1500 m (May, 11, 1960); Mul Pokhari–Dumhan, 2400–700 m (Oct. 30, 1963); Ghatte–Khebang, 1600–1700 m (Nov. 19, 1963); Khebang, 1700 m (Nov. 23, 1963).

Distr. Widely distributed in the tropics of the Old World.

Elaphoglossum yunnanense (Bak.) C. Chr. in Contr. U. S. Nation. Herb. **26**: 327 (1931).

Acrostichum yunnanense Bak. in Kew Bull. **1898**: 233 (1898).

Saramsa Medicinal Garden, 1000 m (Jun. 17, 1960).

Distr. Himalaya, S. W. China, and Malaysia.

Lomariopsis cochinchinensis Fée, Hist. Acrost. 66, t. 26 (1845).

Tista, Darjeeling, 350 m (Jun. 20, 1960).

Distr. Himalaya, Indo-China, Malay, Malay Isls., and New Guinea.

Meniscium proliferum (Retz.) Sw., Syn. Fil. 19, 206 (1806).

Hemionitis proliferum Retz., Obs. Bot. **6**: 36 (1791).

Goniopteris prolifera (Retz.) Presl, Tent. Pterid. 183 (1836)–Bedd., Ferns S. Ind. t. 172 (1864); Handb. Ferns Brit. Ind. 298 (1883)–Ching in Bull. Fan Mem. Inst. Biol. **8**: 260 (1938).

Ampelopteris prolifera (Retz.) Copel., Gen. Fil. 144 (1947)–Alston et Bonner in Candollea **15**: 211 (1956).

Bharomdin–Tharpu, 1000–1200 m (Nov. 25, 1963); Tharpu–near Chyangthaphu (Nov. 26, 1963); Mahara Bhara–Gauriganja–Kathgara, 200 m (Dec. 13, 1963).

Distr. Tropical and subtropical regions throughout the world.

Peranema cyathoides D. Don, Prodr. Fl. Nepal. 12 (1825)–Bedd., Handb. 22 (1883)–Nayar et Kaur in Bull. Bot. Gard. Lucknow no. **81**: 24 (1963).

Sphaeropteris barbata Wall., Cat. no. 183 (1828)–Hope in Journ. Bombay Nat. Hist. Soc. **13**: 28 (1900).

Ghum, Darjeeling, 2200 m (Apr. 4, 1960); Batasi–Palmajua, 2300–2600 m (May 3, 1960); Palmajua–Rimbick, 2300–2200 m (May 5, 1960); Yoksam–Bakkim, 1700–2200m (May 18, 1960); Yoksam–below Bakkim, 1700–2200m (May 18, 1960); Penlong La, Gangtok, 2100 m (Jun. 16, 1960); Murhay–Bilbatay Bhanjang, 2000–2200 m (Oct. 24, 1963); Sinduwa, 2100 m (Oct. 24, 1963); Bilbatay Bhanjang, 2200 m (Oct.

25, 1963); Minchin Dhap–Mul Pokhari, 2800–2400 m (Oct. 29, 1963); Thakma Khola–Yamphodin, 3300–2100 m (Nov. 17, 1963); below Siling Tzokupa–Siling Tzokupa, 2100–3800 m (Nov. 21, 1963); near Chyangthaphu–Birwa, 1100–2400 m (Nov. 27, 1963); Birwa–Yektin, 2400–1700 m (Nov. 28, 1963).

Distr. Himalaya, and Formosa.

Polystichum acanthophyllum (Franch.) Christ in Bull. Soc. Bot. France **52**: Mém. 1, 30 (1905)–C. Chr. in Contr. U. S. Nation. Herb. **26**: 285 (1931).

Aspidium acanthophyllum Franch. in Bull. Soc. Bot. France **32**: 23 (1885).

Minchin Dhap–Mul Pokhari, 2500–3000 m (Oct. 29, 1963); Hati Sar–Lam Pokhari, 2500–3000 m (Oct. 29, 1963).

Distr. Himalaya to China.

Polystichum lachenense (Hook.) Bedd., Ferns Brit. Ind. t. 32 (1865).

Aspidium lachenense Hook., Sp. Fil. **4**: 8 (1862).

Migothang, 3900 m (May 31, 1960); Jongri–Olothang, 4100–3900 m (May 23, 1960).

Distr. Himalaya to China, Formosa, and Japan.

Polystichum lentum (D. Don) Moore, Ind. Fil. 86 (1858).

Aspidium lentum D. Don, Prodr. Fl. Nepal. 4 (1825).

Polystichum auriculatum var. *lentum* (D. Don) Bedd., Handb. 204 (1883).

Kurseong, Darjeeling, 1600 m (Apr. 12 & 23, 1960); Takdah, 1600–1700 m (Apr. 19, 1960); Lopchu, 1500 m (Apr. 28, 1960); Siliguri–Kurseong (Apr. 29, 1960); Rimbick, 2200 m (May 5, 1960); Pamianchi–Tingling Bridge, 2000–1000 m (May 15, 1960); Saramsa Medicinal Garden, 1000 m (Jun. 17, 1960); Pauwa, Kathmandu (Oct. 9, 1963); Phusri–Dhara Pani (Oct. 16, 1963); Tuwa–Taplethok, 1500m (Nov. 5, 1963); Iladanda–Helok (Nov. 13, 1963); Yamphodin–Ghatte, 2000–2500m (Nov. 18, 1963); Khebang–below Siling Tzokupa (Nov. 20, 1963); Tharpu, near Chyangthaphu, 1300 m (Nov. 26, 1963).

Distr. Himalaya.

Polystichum neolobatum Nakai in Bot. Mag. Tokyo **39**: 118 (1925)–C. Chr. in Contr. U. S. Nation. Herb. **26**: 285 (1931).

Selap–Walunchung Gola, 2500–3000 m (Nov. 10, 1963); Walunchung Gola–Zongi, 2500–3000 m (Nov. 11, 1963).

Distr. Himalaya, China, Formosa, and Japan.

Polystichum nepalense (Sprengel) C. Chr., Ind. Fil. 84 (1905)–C. Chr., l.c. 284 (1931).

Aspidium nepalense Sprengel, Syst. Veg. **4**: 97 (1827).

Polystichum auriculatum var. *marginatum* (Wall. ex Mett.) Bedd., Handb. 204 (1883).

Bilbatay Bhanjang–Hati Sar, 2500 m (Oct. 27, 1963); Hati Sar–Minchin Dhap, 2500 m (Oct. 28, 1963); Minchin Dhap–Mul Pokhari, 2500–2800 m (Oct. 29, 1963); Thakma Khola–Bhandukay, 2500–3000 m (Nov. 14, 1963); Bhandukay–Yamphodin, 2000–2500 m (Nov. 17, 1963); Bhuspate Danra, 2600 m (Dec. 2, 1963).

Distr. Himalaya to China, and Formosa.

Polystichum Prescottianum (Wall. ex Mett.) Moore, Ind. Fil. 101 (1858).

Aspidium Prescottianum Wall. ex Mett. in Abh. Senckenb. Ges. Frankfurt **2**: 48 (1858)–Bedd., Handb. 210 (1883).

Phalut, 3000–3500 m (Jun. 5, 1960).

Distr. Himalaya to China, and Formosa.

Polystichum squarrosum (D. Don) Fée, Gen. Fil. 278 (1850-52)-C. Chr., l.c. 286 (1931).

Aspidium squarrosum D. Don, Prodr. Fl. Nepal. 4 (1825).

Dhankuta-Sinduwa, 1500-2000 m (Oct. 22, 1963); Sinduwa, 2100 m (Oct. 24, 1963); Taplejung-Garhi Danra, 1500-2000 m (Nov. 3, 1963); Ghatte-Khebang, 1500-2000 m (Nov. 19, 1963).

Distr. Himalaya to China.

Polystichum stenophyllum Christ in Bull. Soc. Bot. France **52**: Mém. 1, 27 (1905.)

Bilbatay Bhanjang-Hati Sar, 2500-3000 m (Oct. 27, 1963); Bhuspate Danra, 2600 m (Dec. 2, 1963).

Distr. Himalaya to China, and Formosa.

Polystichum stimulans (Kunze ex Mett.) Bedd., Ferns Brit. Ind. t. 31 (1865)-C. Chr., l.c. 285 (1931).

Aspidium ilicifolium D. Don, Prodr. Fl. Nepal. 3 (1825).

Aspidium stimulans Kunze ex Mett. in Abh. Senckenb. Ges. Frankfurt **2**: 327 (1858).

Polystichum ilicifolium (D. Don) Moore, Ind. Fil. 94 (1858), non Fée (1852)-Bedd., Handb. 206 (1883).

Ramam-Phalut, 2400-3500 m (May 9, 1960); Minchin Dhap-Mul Pokhari, 2500-3000 m (Oct. 29, 1963); Selap-Walunchung Gola, 2500-3000 m (Nov. 10, 1963); Zongi-Iladanda (Nov. 12, 1963); Baroya Khimty-Thakma Khola, 2500-3000 m (Nov. 16, 1963).

Distr. Himalaya to W. China (Yunnan).

Polystichum Thomsonii (Hook. f.) Bedd., Ferns Brit. Ind. **1**: t. 126 (1866).

Aspidium Thomsonii Hook. f. in Hook., 2nd Cent. Ferns t. 25 (1860).

Thakma Khola-Diorali Bhanjang (Nov. 14, 1963); Baroya Khimty-Thakma Khola, 2500-3000 m (Nov. 16, 1963).

Distr. Himalaya to China, and Formosa.

Tectaria coadunata (Wall.) C. Chr. in Contr. U. S. Nation. Herb. **26**: 331 (1931)-Tagawa in Act. Phytotax. Geobot. **21**: 180 (1965).

Aspidium coadunatum Wall., Cat. no. 377 (1828)-Hook. et Grev., Icon. Fil. **2**: t. 202 (1831).

Lopchu, Darjeeling, (Apr. 28, 1960); Gangtok, 1000 m (Jun. 17, 1960); Tista, 350 m (Jun. 19, 1960); Phusri-Dhara Pani, 450-900 m (Oct. 16, 1963); Dhara Pani-Tamur Bridge-Dhankuta (Oct. 17, 1963); Dhankuta, 1200 m (Oct. 18, 1963); Mul Pokhari-Dumhan, 2400-700 m (Oct. 30, 1963); Taplethok-Helok 1300-1500 m (Nov. 6, 1963); Helok-Iladanda (Nov. 8, 1963); Ghatte, 1300m (Nov. 17, 1963); Ranga Pani-Ghorwa, 700-300 m (Dec. 9, 1963).

Distr. India, Thai, S. China, Formosa, Malaysia, and tropical Africa.

Tectaria polymorpha (Wall.) Copel. in Philip. Journ. Sci. **2**: 413 (1907).

Aspidium polymorphum Wall., Cat. no. 382 (1828)-Hook., Sp. Fil. **4**: 54 (1862)-Bedd., Handb. 218 (1883).

Takdah, Darjeeling, 1600 m (Apr. 19, 1960); Pamianchi-Tingling Bridge, 2000-1000 m (May 15, 1960); Tuwa-Taplethok, 1800-1300 m (Nov. 5, 1963); below Siling

Tzokupa–Khebang, 2100–1700 m (Nov. 22, 1963); Khebang–Bharomdin, 1700–1000 m (Nov. 24, 1963); near Chyangthaphu–Birwa, 1100–2400 m (Nov. 27, 1963); Illam–Ranga Pani, 1200–700 m (Dec. 8, 1963).

Distr. Himalaya, India, Ceylon, Burma, Malay Peninsula, W. China (Yunnan), Philippines, Malay Isls., and Micronesia.

Thelypteris arida (D. Don) Morton in Amer. Fern Journ. **49**: 113(19 59).

Aspidium aridum D. Don, Prodr. Fl. Nepal. 4 (1825).

Nephrodium aridum (D. Don) J. Smith in Journ. Bot. **4**: 188 (1841)–Bedd., Ferns Brit. Ind. t. 297 (1868); Handb. Ferns Brit. Ind. 272 (1883).

Dhankuta, 1200 m (Oct. 18, 1963); Helok–Iladanda, 1500–1800 m (Nov. 8, 1963).

Distr. Himalaya to Philippines.

Thelypteris auriculata (J. Smith) K. Iwatsuki in Act. Phytotax. Geobot. **19**: 11 (1961).

Polypodium auriculatum (non L. 1753, nec Raddi 1819, nec Pr. 1822) Wall. ex Hook., Sp. Fil. **5**: 237 (1862)–Bedd., Ferns Brit. Ind. t. 203 (1866).

Phegopteris auriculata J. Smith, Hist. Fil. 233 (1875).

Dryopteris hymalayensis C. Chr., Ind. Fil. Suppl. **3**: 88 (1934).

T. subvillosa (Moore) Ching in Bull. Fan Mem. Inst. Biol. **6**: 279 (1936).

Victoria Fall, Darjeeling, 1900 m (Apr. 3, 1960); Darjeeling, 2000 m (Jun. 24, 1960). Sinduwa, 2100 m (Oct. 24, 1963); Bilbatay Bhanjang, 2200 m (Oct. 26, 1963); Helok–Iladanda, 1500–1800 m (Nov. 8, 1963); Khebang–below Siling Tzokupa, 1700–2100 m (Nov. 20, 1963); Mai Majuwa–Dhara Pani, 1600–1500 m (Dec. 4, 1963).

Distr. Himalaya, and Formosa.

Thelypteris aurita (Hook.) Ching in Bull. Fan Mem. Inst. Biol. **6**: 266 (1936).

Gymnogramma aurita Hook., Icon. Pl. t. 974 (1854)–Bedd., Ferns Brit. Ind. Suppl. 24 (1876)–Clarke in Trans. Linn. Soc. ser. 2, **1**: 568 (1880).

Grammitis aurita (Hook.) Moore in Gard. Chron. **1856**: 389 (1856)–Bedd., Ferns Brit. Ind. t. 152 (1866).

Leptogramma aurita (Hook.) Bedd., Handb. Ferns Brit. Ind. 377 (1883).

Birch Hill, Darjeeling, 2000 m (Apr. 5, 1960); Gangtok, 1600 m (Jun. 14, 1960); Penlong La, Gangtok, 2100 m (Jun. 16, 1960); Happy Valley, 1900 m (Jun. 26, 1960); Dhankuta–Sinduwa, 1200–2100 m (Oct. 22, 1963); Murhay, 2000 m (Oct. 23, 1963); Dumhan–Tapleju ng,700–2000 m (Nov. 1, 1963); Taplejung, 1700 m (Nov. 2, 1963); Ghatte–Khebang, 1600–1700 m (Nov. 19, 1963); Tharpu–Khunga, 1200–2000 m (Nov. 27, 1963); Yektin–Batasay, 1400–2400 m (Nov. 30, 1963).

Distr. Himalaya to Tonkin.

Thelypteris ciliata (Wall. ex Benth.) Ching in Bull. Fan Mem. Inst. Biol. **6**: 289 (1936).

Aspidium ciliatum Wall. ex Benth., Fl. Hongk. 455 (1861).

Lastrea sericea Schott ex Bedd., Ferns Brit. Ind. t. 308 (1867).

L. calcarata var. *sericea* Bedd., Handb. Ferns Brit. Ind. 237 (1883).

Ranga Pani–Ghorwa, 700–300 m (Dec. 9, 1963).

Distr. Himalaya to Malay Peninsula.

Thelypteris cylindrothrix (Ros.) K. Iwatsuki, comb. nov.

Nephrodium molle var. *aureum* (Clarke) Bedd., Handb. Ferns Brit. Ind. 279

(1883).

Dryopteris cylindrothrix Ros. in Fedde, Rep. **12**: 246 (1913).

Cyclosorus cylindrothrix (Ros.) Ching in Bull. Fan Mem. Inst. Biol. **8**: 199 (1938).

Tuwa–Taplethok, 1800–1300 m (Nov. 5, 1963); Khebang–below Siling Tzokupa, 1700–2100 m (Nov. 20, 1963).

Distr. Himalaya to N. Thai.

Thelypteris dentata (Forsk.) St. John in Amer. Fern Journ. **26**: 44 (1936).

Polypodium dentatum Forsk., Fl. Aegypt.-Arab. 185 (1775).

Nephrodium procurrens (Mett.) Bak. in Hook., Syn. Fil. 290 (1867) p.p.–Clarke in Trans. Linn. Soc. ser. 2, **1**: 530 (1880)–Bedd., Handb. Ferns Brit. Ind. 278 (1883).

Cyclosorus dentatus (Forsk.) Ching in Bull. Fan Mem. Inst. Biol. **8**: 206 (1938).

Takdah, Darjeeling, 1600–1700 m (Apr. 18, 1960); Rayang, 250 m (Apr. 21, 1960); Siliguri–Kurseong (Apr. 29, 1960); Gangtok–Rangpo, 1600–400 m (Jun. 18, 1960). Kathmandu Airport, 1400 m (Oct. 13, 1963); Dhankuta, 1200 m (Oct. 19, 1963); below Siling Tzokupa–Siling Tzokupa, 2100–3800 m (Nov. 21, 1963); Bharomdin–Tharpu, 1000–1200 m (Nov. 25, 1963); Illam, 1200 m (Dec. 7, 1963).

Distr. Tropical and subtropical regions of the world, sometimes extending to the warm temperate zones.

Thelypteris Duclouxii (Christ) Ching in Bull. Fan Mem. Inst. Biol. **6**: 303 (1936).

Dryopteris Duclouxii Christ in Bull. Acad. Géogr. Bot. **17**: 139 (1907).

Sinduwa, 2100 m (Oct. 24, 1963); Yektin–Akasay, 1400–2300 m (Nov. 30, 1963); Mai Majuwa–Dhara Pani, 1600–1500 m (Dec. 4, 1963).

Distr. E. Himalaya (Nepal), and SW. China.

The present identification is made by referring only to the description, but no discrepancy is found against this except in the presence of indusia. In Christ's original description, it is described that the 'soris . . . exindusiatis', but, as correctly noted by Ching (l.c.), submarginal sori bear large and membraneous indusia. This species seems to be very close to *T. Esquirolii*, but the reduced, or butter-fly like, lower pinnae and the larger size of lateral pinnae are characteristic to this species.

Thelypteris erubescens (Wall. ex Hook.) Ching in Bull. Fan Mem. Inst. Biol. **6**: 293 (1936).

Polypodium erubescens Wall. ex Hook., Sp. Fil. **4**: 236 (1862)–Bedd., Ferns Brit. Ind. t. 213 (1867).

Phegopteris erubescens (Hook.) J. Smith, Hist. Fil. 233 (1875)–Bedd., Handb. Ferns Brit. Ind. 289 (1883).

Helok–Iladanda, 1500–1800 m (Nov. 8, 1963).

Distr. Himalaya, Tonkin and Laos, Malaysia, SW. China, Formosa, extending north to the southern edge of Japan.

Thelypteris Esquirolii (Christ) Ching in Bull. Fan Mem. Inst. Biol. **6**: 301 (1936).

Dryopteris Esquirolii Christ in Bull. Acad. Géogr. Bot. **17**: 144 (1907).

Birch Hill, Darjeeling, 2000 m (Apr. 7, 1960); Penlong La, Gangtok, 2100 m (Jun. 16, 1960); Kathmandu Airport, 1400 m (Oct. 13, 1963); Sinduwa, 2100 m (Oct. 23, 1963); Murhay–Bilbatay Bhanjang, 2000–2200 m (Oct. 24, 1963); Taplejung–Garhi

Danra, 2000–2200 m (Nov. 3, 1963); Helok–Iladanda, 1500–1800 m (Nov. 8, 1963).
Distr. Himalaya to Indo-China, extending to Japan.

Thelypteris khasiensis Ching in Bull. Fan Mem. Inst. Biol. **6**: 284 (1936).
Yektin–Batasay, 1500 m (Nov. 30, 1963).
Distr. E. Himalaya (E. Nepal), and Assam.

This species was described on the basis of a sole specimen in US, which matches our material with little doubt. Except the difference in size, the four sheets of the above mentioned specimen accord very well in the important characteristics, though the rhizome is not present. The size of our material is: stipe 40–45 cm long; fronds 40–55 cm long, 17–20 cm wide, with more than 20 pairs of the pinnae up to 10 cm in length; segments 20–25 pairs in larger pinnae. The hairs on the under surface of leaves and on sporangia are hooked, and on the upper surface of laminar portion as well as on various axes are setose, stiff, and rather dense.

Thelypteris laete-strigosa (C. B. Clarke) K. Iwatsuki, comb. nov.
Nephrodium glandulosum var. *laete-strigosa* C. B. Clarke in Trans. Linn. Soc. ser. 2, **1**: 532 (1880).
Cyclosorus laete-strigosus (Clarke) Ching in Bull. Fan Mem. Inst. Biol. **8**: 227 (1938).
Illam–Ranga Pani, 700 m (Dec. 8, 1963).
Distr. Himalaya.

The difference between the fertile and the sterile leaves is rather slight in our material; the fertile leaves are taller with the stipes about 60 cm in length and the lower pinnae 4–5 cm remote from each other, and the sterile ones, on the contrary, bear the stipes less than 30 cm, and very close pinnae about 3 cm remote from each other even in the lower ones. The size of pinnae is not so particular: the large lateral fertile pinnae are 15 cm long and almost 3 cm wide, with broadly cuneate and very shortly petiolulate base, and the sterile ones are as wide as the fertile ones and shorter, about 12 cm in the longest ones, the base being truncate and sessile. This species is well characterized by the distinct short strigose hairs which are rather dense on both sides of every axis as well as on the upper surface of the laminar portion and somewhat sparsely present on the under surface of the laminar portion. The scales are found on the stipes throughout, caducous or hardly persistent, large, membraneous, light-brown, rather irregular in outline, more or less hairy.

Thelypteris lakhimpurensis (Ros.) K. Iwatsuki in Mem. Coll. Sci. Univ. Kyoto B, **31**: 194 (1965).
Dryopteris lakhimpurensis Ros. in Med. Rijks. Herb. Leiden no. **31**: 7 (1917).
Tharpu–near Chyangthaphu, 1200–1100 m (Nov. 26, 1963).
Distr. Himalaya.

Thelypteris molliuscula (Kuhn) K. Iwatsuki, comb. nov.
Aspidium molliusculum Kuhn in Bot. Zeit. **26**: 41 (1868).
Nephrodium extensum var. *microsorum* et var. *late-repens* Clarke in Trans. Linn. Soc. ser. 2, **1**: 580 (1880).
N. microsorum (Clarke) Bedd., Handb. Ferns Brit. Ind. 270 (1883).
N. Hopei Bak. in Ann. Bot. **5**: 326 (1891).

Nephrodium molliusculum (Kuhn) Bedd., Handb. Ferns Brit. Ind. Suppl. 68 (1892).

Cyclosorus molliusculus (Kuhn) Ching in Bull. Fan Mem. Inst. Biol. **8**: 197 (1938).

Siliguri–Kurseong (Apr. 29, 1960); Tista, 350 m (Jun. 19, 1960); Dhara Pani–Dhankuta, 900–1200 m (Oct. 17, 1963); Dumhan–Taplejung, 700–2000 m (Nov. 1, 1963); Khebang–Bharomdin, 1700–1000 m (Nov. 24, 1963); Yektin, 1100 m (Nov. 29, 1963); Ranga Pani–Sanichare, 700–300 m (Dec. 9, 1963).

Distr. Himalaya.

Thelypteris multilineata (Wall. ex Hook.) Morton in Amer. Fern Journ. **49**: 113 (1959).

Polypodium multilineatum Wall. ex Hook., Sp. Fil. **5**: 11 (1863)–Clarke in Trans. Linn. Soc. ser. 2, **1**: 547 (1880).

Goniopteris lineata Pr. sensu Bedd., Ferns Brit. Ind. t. 3 (1866).

Goniopteris multilineata (Hook.) Bedd., Ferns Brit. Ind. t. 231 (1867).

Nephrodium moulmeinensis Bedd., Ferns Brit. Ind. Suppl. 18 (1876), nom.; Handb. Ferns Brit. Ind. 275 (1883); Suppl. 73 (1892).

Rayang, Darjeeling, 250 m (Apr. 21, 1960); Pamianchi–Tingling Bridge, 2000–1000 m (May 15, 1960); Rangpo–Tista (Jun. 18, 1960); Dhankuta, 1200 m (Oct. 20, & 21, 1963); Ranga Pani–Ghorwa, 700–300 m (Dec. 9, 1963); Ghorwa–Sanichare, 300–200 m (Dec. 10, 1963).

Distr. Himalaya to Polynesia throughout Malaysia.

Thelypteris ornata (Wall. ex Bedd.) Ching in Bull. Fan Mem. Inst. Biol. **6**: 346 (1936)–K. Iwats., l.c. 156 (1965).

Polypodium ornatum Wall. ex Bedd., Ferns S. Ind. t. 171 (1864).

Rayang, Darjeeling, 250 m (Apr. 21, 1960); Siliguri–Kurseong (Apr. 29, 1960); Tista–Kalimpong, 800 m (Jun. 19, 1960); Illam–Ranga Pani, 1200–700 m (Dec. 8, 1963); Ranga Pani–Ghorwa, 700–300 m (Dec. 9, 1963).

Distr. Himalaya to Indo-China, and Formosa.

Thelypteris paludosa (Bl.) K. Iwats. in Act. Phytotax. Geobot. **19**: 11 (1961).

Aspidium paludosum (non Raddi 1825) Bl., Enum. Pl. Jav. 168 (1828).

Polypodium paludosum Bl., Fl. Jav. Fil. 192, t. 90 (1829).

T. brunnea Ching in Bull. Fan Mem. Inst. Biol. **6**: 269 (1936).

Bilbatay Bhanjang–Hati Sar, 2200–2700 m (Oct. 27, 1963); Selap–Walunchung Gola, 2600–3500 m (Nov. 10, 1963); Thakma Khola–Yamphodin, 3300–2100 m (Nov. 17, 1963).

Distr. Himalaya to Polynesia throughout Malaysia, and Formosa.

Thelypteris subpubescens (Bl.) K. Iwats. in Mem. Coll. Sci. Univ. Kyoto, B, **31**: 173 (1965).

Aspidium subpubescens Bl., Enum. Pl. Jav. 149 (1828).

Nephrodium amboinense Presl, Tent. Pterid. 81 (1836)–Bedd., Handb. Ferns Brit. Ind. Suppl. 75 (1892).

N. molle var. *amboinense* (Pr.) Bedd., Handb. Ferns Brit. Ind. 278 (1883).

N. extensum var. *minor* Bedd., Ferns Brit. Ind. t. 201 (1886).

Cyclosorus subpubescens (Bl.) Ching in Bull. Fan Mem. Inst. Biol. **8**: 211 (1938).

Illam–Ranga Pani, 1200–700 m (Dec. 8, 1963).

Distr. Southeast Asia to Malaysia.

Thelypteris Torresiana (Gaud.) Alston in Lilloa **30**: 11 (1960)–K. Iwats. in Mem. Coll. Sci. Univ. Kyoto, B, **31**: 151 (1965).

Polystichum Torresianum Gaud. in Freyc. Voy. Bot. 333 (1827).

Lastrea tenericaulis (Hook.) Moore, Ind. Fil. 99 (1858)–Bedd., Handb. Ferns Brit. Ind. 266 (1883).

L. setigera (Bl.) Bedd., Ferns Brit. Ind. Corr. II (1870); non Moore 1858.

T. uliginosa (Kunze) Ching in Bull. Fan Mem. Inst. Biol. **6**: 342 (1936).

Rayang, Darjeeling, 250 m (Apr. 21, 1960); Phusri–Dhara Pani, 450–900 m (Oct. 16, 1963).

Distr. Southeast Asia to Australia.

Thelypteris xylodes (Kunze) Ching in Bull. Fan Mem. Inst. Biol. **6**: 296 (1936).

Aspidium xylodes Kunze in Linnaea **24**: 281 (1851).

Lastrea tylodes Bedd., Ferns S. Ind. t. 107 (1863); Handb., Ferns Brit. Ind. 240 (1883), also as *Lastrea ochthodes* var. *tylodes*.

Kathmandu Airport, 1400 m (Oct. 13, 1963).

Distr. India throughout to Ceylon.

Thelypteris yunkweiensis Ching in Bull. Fan Mem. Inst. Biol. **6**: 274 (1936).

Thakma Khola–Yamphodin, 3000 m (Nov. 17, 1963).

Distr. Himalaya, SW. Tonkin, and China.

It remains some questions to refer the above material to this species. The tripinnatifid plants are smaller in size: stipes 50 cm long, not so thick as a small finger even at the lowest portion, fronds 60 cm long, 30 cm broad at middle part, pinnae 20 cm long, at most 10 cm broad at the basal part. Moreover, our material differs from the authentic specimen of the species in thin and herbaceous texture and in pale stramineous, not shining, nor castaneous stipes.

Woodsia cycloloba Hand.-Mzt., Symb. Sin. **6**: 19 (1929)–Ching in Sinensia **3**: 149 (1932).

Gamothang, 3800 m (May 29, 1960).

Distr. Himalaya (a new record), and W. China (Yunnan, Shensi).

BLECHNACEAE (by Hirosi Ito)

Woodwardia unigemmata (Makino) Nakai in Bot. Mag. Tokyo **39**: 103 (1925)–Tagawa in Kitamura, Faun. & Fl. Nepal Himal. **1**: 80 (1955)–Stewart in Biologia **3** (2): 18 (1957).

W. radicans (L.) Sm. var. *unigemmata* Makino in Journ. Jap. Bot. **2**: 7 (1918).

Senchal–Takdah, 2000 m (Apr. 17, 1960); Rimbick–Ramam, 1900–2400 m (May 7, 1960); Ghum–Lopchu, 2000 m (Jun. 19, 1960); Bilbatay Bhanjang, 2200 m (Oct. 25, 1963); Helok, 1500 m (Nov. 8, 1963); Helok–Iladanda, 1500–1800 m (Nov. 8, 1963); Iladanda–Selap, 1800–2600 m (Nov. 9, 1963); Zongi–Iladanda, 2600–1800 m (Nov. 12, 1963).

Distr. Himalaya, Tonkin, China, Formosa, Japan, and Philippines.

ASPLENIACEAE (by Hirosi Ito)

Asplenium cheilosorum Kunze in Mett., Aspl. 133 (1859)–Sledge in Bull. Brit. Mus. Bot. **3**: 245 (1965).

A. heterocarpum Wall., Cat. no. 218 (1828)–Bedd., Handb. Ferns Brit. Ind. 153 (1883).

Kurseong, Darjeeling, 1600 m (Apr. 12, 1960); Lopchu, 1500 m (Apr. 28, 1960); Peshok, 1500 m (Jun. 19, 1960); Khebang-below Siling Tzokupa, 1700–2100 m (Nov. 20, 1963).

Distr. Himalaya, India, Ceylon, Burma, Indo-China, Malay Peninsula, China, Formosa, Is. Yakusima, Is. Tanegasima, Philippines, and Malay Isls.

Asplenium Dalhausiae Hook., Icon. Fil. t. 105 (1837).

A. alternans Wall., Cat. no. 221 (1828)–Hook., Sp. Fil. **3**: 92 (1860)–Bedd., Handb. 142 (1883)–Hope in Journ. Bombay Nat. Hist. Soc. **13**: 460 (1901).

Ceterach Dalhausiae (Hook.) C. Chr., Ind. Fil. 170 (1905)–Stewart in Biologia **3** (2): 17 (1957).

Senchal, Darjeeling, 2300 m (Apr. 16, 1960); Taplejung, 1700 m (Nov. 2, 1963); Batasay–Bhuspate Danra, 2400–2900 m (Dec. 1, 1963); Bhuspate Danra, 2900 m (Dec. 2, 1963).

Distr. Afghanistan, Himalaya (Kashmir to Assam), and Ethiopia.

Asplenium ensiforme Wall. [Cat. no. 200 (1828)] ex Hook. et Grev., Icon. Fil. **1**: t. 71 (1828)–Bedd., Handb. 141 (1883)–Hope in Journ. Bombay Nat. Hist. Soc. **13**: 460 (1901)–Sledge in Bull. Brit. Mus. Bot. **3**: 242 (1965).

Senchal, Darjeeling, 2300 m (Apr. 6, 1960); Yoksam, 1700 m (May 17, 1960); Yoksam–Bakkim, 1700–2500 m (May 18, 1960); Bakkim–Jongri, 2500–4000 m (May 19, 1960); Garibans, 2800 m (Jun. 7, 1960); Ghum–Kurseong, 2200 m (Jun. 22, 1960); Senchal–Tiger Hill, 2400–2500 m (Jun. 23, 1960); Sinduwa, 2100 m (Oct. 24, 1963); Bilbatay Bhanjang, 2200 m (Oct. 25 & 26, 1963); Bilbatay Bhanjang–Tinjuray, 2200–2700 m (Oct. 27, 1963); Taplejung, 1700 m (Nov. 2, 1963); Helok–Baroya Khimty, 1500–2500 m (Nov. 10, 1963); Baroya Khimty, 2500 m (Nov. 11, 1963); Walunchung Gola–Zongi, 3500–2600 m (Nov. 11, 1963); Zongi–Iladanda (Nov. 12, 1963); Thakma Khola–Bhandukay, 3200–2400 m (Nov. 14, 1963); Baroya Khimty–Thakma Khola, 2500–3300 m (Nov. 16, 1963); near Chyangthaphu–Birwa, 1100–2400 m (Nov. 27, 1963); Birwa–Yektin, 2400–1700 m (Nov. 28, 1963)); Batasay–Bhuspate Danra, 2400–2900 m (Dec. 1, 1963); Bhuspate Danra, 2600 m (Dec. 2, 1963).

Distr. Himalaya, India, Ceylon, Burma, Indo-China, S. W. China, Formosa, Japan, and Africa.

Asplenium indicum Sledge in Bull. Brit. Mus. Bot. **3**: 264 (1965).

A. planicaule Wall., Cat. no. 189 (1828), nom. nud.–Mett., Aspl. 157 (1859); non Lowe 1858–Bedd., Ferns S. Ind. 139 (1863)–Hope in Journ. Bombay Nat. Hist. Soc. **13**: 659 (1901).

Kurseong, Darjeeling, 1600 m (Apr. 12, 1960); Takdah, 1600 m (Apr. 18 & 19, 1960); Pamianchi–Tingling Bridge, 2000–1000 m (May 15, 1960); Ratong Chu–Yoksam, 1000–1700m (May 16, 1960); Yoksam, 1800m (May 17, 1960); Penlong La, Gangtok, 2100 m (Jun. 16, 1960 & Mar. 18, 1963); Dhankuta–Murhay, 1200–2000 (Oct. 23, 1963); Sinduwa, 2100 m (Oct. 23, 1963); Bilbatay Bhanjang–Hati Sar, 2200–2700 m (Oct. 27, 1963); Mul Pokhari–Dumhan, 2400–700 m (Oct. 30, 1963); Garhi Danra–Tuwa, 2200–1800 m (Nov. 4, 1963); Tuwa–Taplethok (Nov. 5, 1963); Taplethok–Helok, 1300–1500 m (Nov. 6, 1963); Iladanda–Helok, 1800–1500 m (Nov. 13, 1963); Ghatte–Khebang, 1600–1700 m (Nov. 19, 1963); Khebang–below Siling

Tzokupa, 1700–2100 m (Nov. 20, 1963).

Distr. Himalaya, India, Ceylon, China, and Madagascar.

Asplenium laciniatum D. Don, Prodr. Fl. Nepal. 8 (1825)–Bedd., Handb. 154 (1883), p.p.

Takdah, Darjeeling, 1600–1700 m (Apr. 18, 1960); Yoksam–Bakkim, 1700–2200 m (May 18, 1960); Ghatte–Khebang, 1600–1700 m (Nov. 19, 1963).

Distr. Himalaya, India, Ceylon, and Formosa.

Asplenium macrophyllum Sw. in Schrad. Journ. Bot. **1800** (2): 52 (1801)–Bedd., Handb. 150 (1883).

Illam–Ranga Pani, 1200–700 m (Dec. 8, 1963); Ranga Pani–Ghorwa (Dec. 9, 1963); Ghorwa–Sanichare, 300–200 m (Dec. 10, 1963).

Distr. Himalaya, India, Ceylon, Tonkin, Malay Peninsula, Malay Isls., Polynesia, and Mascarene Isls.

Asplenium nidus L., Sp. Pl. ed. 1, **2**: 1079 (1753)–Hope in Journ. Bombay Nat. Hist. Soc. **13**: 459 (1901)–Sledge in Bull. Brit. Mus. Bot. **3**: 242 (1965).

Thamnopteris nidus (L.) Presl, Epim. Bot. 68 (1849)–Bedd., Handb. 137 (1883).

Ratong Chu–Tingling Bridge, 1000 m (May 15, 1960).

Distr. Widely distributed in the tropics and subtropics of the Old World.

Asplenium normale D. Don, Prodr. Fl. Nepal. 7 (1825)–Bedd., Handb. 144 (1883)–Sledge, l.c. 243 (1965).

Kurseong, Darjeeling, (Apr. 12, 1960); Takdah, 1600 m (Apr. 20, 1960); Yoksam, 1700 m (May 17, 1960).

Distr. E. Africa, India, Ceylon, Indo-China, Malay Peninsula, China, Formosa, Japan, Philippines, Malay Isls., Polynesia, and Hawaii.

Asplenium Phyllitidis D. Don, Prodr. Fl. Nepal. 7 (1825)–Holtt., Fl. Malaya **2**: 420 (1954).

Thamnopteris nidus (L.) Presl var. γ. *Phyllitidis* (Don) Bedd., Handb. 139 (1883).

Lopchu, Darjeeling, 1500 m (Apr. 28, 1960); Singtam–Gangtok, 700 m (Mar. 29, 1963); Tuwa–Taplethok, 1800–1300 m (Nov. 5, 1963); Tharpu–near Chyangthaphu, 1200–1100 m (Nov. 26, 1963).

Distr. India, Malay Peninsula, Malay Isls., and Philippines.

Asplenium pseudolaserpitiifolium Ching ex Tardieu et Ching in Notul. Syst. (Paris) **5**: 150 (1936).

Lopchu, Darjeeling, 1500 m (Apr. 28, 1960); Yoksam–Bakkim, 1700–2200 m (May 18, 1960); Iladanda–Selap, 1800–2600 m (Nov. 9, 1963).

Distr. Himalaya (a new record), Tonkin, Annam, and Hainan.

Asplenium tenuifolium D. Don, Prodr. Fl. Nepal. 8 (1825)–Bedd., Handb. 159 (1883)–Hope in Journ. Bombay Nat. Hist. Soc. **13**: 667 (1901)–Sledge, l.c. 275 (1965).

Senchal, Darjeeling, 2300 m (Apr. 6, 1960); 2100 m (Apr. 7, 1960); Kurseong, 1600 m (Apr. 12, 1960); Takdah, 1600 m (Apr. 18 & 19, 1960); Batasi–Palmajua, 2300–2600 m (May 3, 1960); Rimbick–Ramam, 1900–2400 m (May 7, 1960); Zongi–Iladanda, 2600–1800 m (Nov. 12, 1963); Mai Majuwa–Dhara Pani, 1600–1500 m (Dec. 4, 1963).

Distr. Himalaya, India, Ceylon, Burma, Indo-China, Malay Peninsula, China, and Formosa.

Asplenium unilaterale Lam., Encyc. Méth. **2**: 305 (1786)-Bedd., Handb. 152 (1883)-Hope in Journ. Bombay Nat. Hist. Soc. **13**: 658 (1901)-Sledge, l.c. 245 (1965).

Senchal, 2300 m (Apr. 6. 1960) ; Takdah, 1600 m (Apr. 17, 1960) ; Palmajua-Rimbick, 2300-2200 m (May 5, 1960) ; Yoksam-Bakkim, 1700-2200 m (May 18, 1960) ; Bakkim, 2500 m (May 19, 1960) ; Sinduwa, 2100 m (Oct. 23, 1963) ; Bilbatay Bhanjang, 2200 m (Oct. 26, 1963) ; Helok-Iladanda, 1500-1800 m (Nov. 8, 1963) ; Iladanda-Selap, 1800-2600 m (Nov. 9, 1963) ; Zongi-Iladanda, 2600-1800 m (Nov. 12, 1963) ; Birwa-Yektin, 2400-1700 m (Nov. 28, 1963) ; Mai Majuwa-Mai Pokhari-Dhara Pani, 1600-1500 m (Dec. 4, 1963).

Dist. Himalaya, India, Ceylon, Burma, Indo-China, Malay Peninsula, China, Formosa, Japan, Philippines, Malay Isls., Polynesia, Hawaii, and E. Africa.

Asplenium varians Wall. ex Hook. et Grev., Icon. Fil. **2**: t. 172 (1829)-Bedd., Handb. 158 (1883)-Hope in Journ. Bombay Nat. Hist. Soc. **13**: 667 (1901)-Stewart in Biologia **3** (2): 17 (1957)-Sledge, l.c. 272 (1965).

Thakma Khola-Yamphodin, 3300-2100 m (Nov. 17, 1963).

Distr. India, Ceylon, China, Formosa, Korea, Japan, and Philippines.

POLYPODIACEAE (by Motozi Tagawa)

Aglaomorpha coronans (Wall. ex Mett.) Copel. in Univ. Calif. Publ. Bot. **16**: 117 (1929).

Polypodium coronans Wall. ex Mett. in Abh. Senckenb. Naturforsch. Ges. **2**: 121, t. 3, f. 40, 41 (1857).

Drynaria coronans (Wall. ex Mett.) J. Sm. apud Bedd., Ferns Brit. India pl. 13 (1865); Handb. 338 (1883).

Pseudodrynaria coronans (Wall. ex Mett.) Ching in Sunyatsenia **5**: 357 (1940)-Nayar in Bull. Bot. Gard. Lucknow no. **56**: 20 (1961).

Lopchu, Darjeeling, 900 m (Apr. 27, 1960) ; Illam-Ranga Pani, 1200-500 m (Dec. 8, 1963).

Distr. N. E. Himalaya east to Formosa and Ryukyu, and south to Cochin-China.

Arthromeris himalayensis (Hook.) Ching in Contr. Inst. Bot. Nat. Acad. Peiping **2**: 99 (1933); Icon. Fil. Sin. **3**: pl. 149 (1935).

Polypodium himalayense Hook., Sp. Fil. **5**: 91 (1863).

Pleopeltis himalayensis (Hook.) Bedd., Ferns Brit. Ind. pl. 318 (1869); Handb. 370, f. 212 (1883).

Rimbick-Ramam, 2200-2400 m (May 7, 1960) ; Yoksam-Bakkim, 1700-2200 m (May 18, 1960, no. 348) ; Zongi-Iladanda (Nov. 12, 1963) ; Baroya Khimty-Thakma Khola, 2500-3000 m (Nov. 12 & 16, 1963) ; Batasay-Bhuspate Danra, 2400-2600 m (Dec. 1, 1963).

Distr. E. Himalaya (Nepal to Bhutan), Khasia Hills, N. Burma, and W. China (Yunnan).

Var. *furcans* Ching (op. cit. 100) from Sikkim (Duthie 5177) is said to have irregularly lacerate-forked pinnae, and it may be a monstrosity not worthy of taxonomic distinction.

Arthromeris Lehmannii (Mett.) Ching in Contr. Inst. Bot. Nat. Acad. Peiping **2**: 96 (1933).

Polypodium Lehmannii Mett. in Abh. Senckenb. Naturforsch. Ges. **2**: 109(1857).

Pleopeltis Lehmannii (Mett.) Bedd., Ferns Brit. India pl. 260 (1868); Handb. 370, f. 211 (1883).

Bilbatay Bhanjang–Hati Sar, 2200–2900 m (Oct. 27, 1963); Minchin Dhap-Mul Pokhari, 2800–2500 m (Oct. 29, 1963).

Distr. Himalaya to SW. China, and Formosa, also in Assam, N. Burma, and N. Thai.

Arthromeris lungtauensis Ching in Contr. Inst. Bot. Nat. Acad. Peiping **2**: 98 (1933).

Ghum–Kurseong, Darjeeling, 2200 m (Jun. 22, 1960).

Distr. E. Himalaya, Tonkin, Laos, and S. China (Kwangtung, Hainan). The first record for the Himalaya.

Arthromeris Wallichiana (Sprengel) Ching in Contr. Inst. Bot. Nat. Acad. Peiping **2**: 92 (1933).

Polypodium juglandifolium D. Don, Prodr. Fl. Nepal. 3 (1825); non Humb. & Bonpl. ex Willd. (1810).

Polypodium Wallichianum Sprengel, Syst. Veg. **4**: 53 (1827), based on *P. juglandifolium* Don.

Pleopeltis juglandifolia (D. Don) Moore, Ind. Fil. lxxviii (1857)–Bedd., Handb. 370, f. 210 (1883).

Pleopeltis capitellata (Mett.) Bedd., Ferns Brit. India pl. 12 (1865).

Birch Hill, 2000 m (Apr. 5 & 16, 1960); Penlong La, Gangtok, 2100 m (Jun. 16, 1960); Darjeeling, 2000 m (Jun, 21, 1960); Murhay, Dhankuta Distr., 2000 m (Oct. 24, 1963); Sinduwa, 2100 m (Oct. 24, 1963); Helok, 1500 m (Nov. 8, 1963); Helok –Iladanda, 1500–1800 m (Nov. 8, 1963); Iladanda–Selap, 1800–2600 m (Nov. 9, 1963); Batasay–Bhuspate Danra, 2400–2600 m (Dec. 1, 1963).

Distr. N. India, Burma, Tonkin, and W. China (Yunnan, Kweichow).

Belvisia Henryi (Hieron. ex C. Chr.) Tagawa, comb. nov.

Hymenolepis Henryi Hieron. ex C. Chr. in Dansk Bot. Ark. **6** (3): 67 (1929).

Gymnopteris spicata auct. non (L. f.) Presl; Bedd., Handb. 432 (1883), p.p.

Below Siling Tzokupa–Khebang (Nov. 22, 1963); Tharpu – near Chyangthaphu, 1200 m (Nov. 26, 1963).

Distr. E. Himalaya, Assam, N. Burma, N. Thai, and W. China (Yunnan).

Colysis hemionitidea Presl, Epim. Bot. 147 (1849)–Ching in Bull. Fan Mem. Inst. Biol. **4**: 320 (1933); Icon. Fil. Sin. **4**: pl. 195 (1937).

Polypodium hemionitideum (Presl) Wall. ex Mett. in Abh. Senckenb. Naturforsch. Ges. **2**: 112 (1857).

Pleopeltis hemionitidea (Presl) Moore, Ind. Fil. 346 (1862)–Bedd., Handb. 358 (1883).

Lopchu, Darjeeling, 1500 m (Apr. 28, 1960).

Distr. N. India through SW. and S. China to Formosa, Ryukyu, SW. Japan (Kyushu), south to Indo-China, and Philippines.

Colysis latiloba (Ching) Ching in Bull. Fan Mem. Inst. Biol. **4**: 330 (1933).

Polypodium latilobum Ching in Bull. Fan Mem. Inst. Biol. **2**: 21, pl. 7 (1931).

Lopchu, Darjeeling, 1500 m (Apr. 28, 1960); Khebang–below Siling Tzokupa, 1500–2000 m (Nov. 20 & 22, 1963); Khebang–Bharomdin, 1000–1500 m (Nov. 24, 1963);

Distr. Himalaya, and Assam.

Colysis pothifolia (D. Don) Presl, Epim. Bot. 148 (1849).

Hemionitis pothifolia D. Don, Prodr. Fl. Nepal. 13 (1825).

Selliguea elliptica Bedd., Ferns Brit. Ind. Index (1870); not *Polypodium ellipticum* Thunb., the source of the name; Handb. 392 (1883).

Colysis elliptica var. *pothifolia* (D. Don) Ching in Bull. Fan Mem. Inst. Biol. **4**: 334 (1933).

Lopchu, Darjeeling, 1500 m (Apr. 28, 1960).

Distr. N. India to SW. Japan, south to Indo-China and Philippines.

Crypsinus ebenipes (Hook.) Copel., Gen. Fil. 206 (1947).

Polypodium ebenipes Hook., Sp. Fil. **5**: 88 (1863).

Pleopeltis ebenipes (Hook.) Bedd., Ferns Brit. Ind. pl. 138 (1866); Handb. 363 (1883).

Phymatodes ebenipes (Hook.) Ching in Contr. Inst. Bot. Nat. Acad. Peiping **2**: 86 (1933).

Sinduwa, 2100 m (Oct. 24, 1963); Bilbatay Bhanjang–Hati Sar, 2500 m (Oct. 27, 1963); Hati Sar–Minchin Dhap (Oct. 28, 1963); Baroya Khimty–Thakma Khola, 2500–3000 m (Nov. 16, 1963); Bhuspate Danra, 2600 m (Dec. 2, 1963).

Distr. Himalaya to W. China (Yunnan), and N. Thai.

Crypsinus erythrocarpus (Mett. ex Kuhn) Tagawa, comb. nov.

Polypodium erythrocarpum Mett. ex Kuhn in Linnaea **36**: 135 (1869).

Goniophlebium erythrocarpum (Mett. ex Kuhn) Bedd., Fern. Brit. Ind. Suppl. 21, pl. 382 (1876); Handb. 319 (1833).

Phymatodes erythrocarpa (Mett. ex Kuhn) Ching in Contr. Inst. Bot. Nat. Acad. Peiping **2**: 80 (1933).

Baroya Khimty–Thakma Khola, 2500–3000 m (Nov. 16, 1963); Thakma Khola–Yamphodin, 3000–2500 m (Nov. 17, 1963).

Distr. Himalaya.

Crypsinus Griffithianus (Hook.) Copel., Gen. Fil. 206 (1947).

Polypodium Griffithianum Hook., Icon. Pl. t. 951 (1854).

Pleopeltis Griffithiana (Hook.) Moore, Ind. Fil. lxxviii (1857)–Bedd., Handb. 354 (1883).

Phymatodes Griffithiana (Hook.) Ching in Contr. Inst. Bot. Nat. Acad. Peiping **2**: 71 (1933).

Butia Basti, Darjeeling, 1900 m (Apr. 6, 1960); Kurseong, 1600 m (Apr. 12, 1960); Batasi–Palmajua, 2100–2300 m (May 3, 1960, no. 38); Happy Valley, 1900m (Jun. 26, 1960); Mul Pokhari–Dumhan, 2500 m (Oct. 30, 1963); Iladanda–Selap, 1500–2500 m (Nov. 9, 1963); Birwa–Yektin, 1500–2000 m (Nov. 28, 1963); Minchin Dhap–Mul Pokhari, 2500–3000 m (Oct. 29, 1963).

Distr. Himalaya, SW. China, south to W. Malaysia.

Crypsinus malacodon (Hook.) Copel., Gen. Fil. 206 (1947).

Polypodium malacodon Hook., Sp. Fil. **5**: 87 (1863).

Pleopeltis malacodon (Hook.) Bedd., Handb. 363 (1883).

Phymatodes malacodon (Hook.) Ching in Contr. Inst. Bot. Nat. Acad. Peiping 2: 83 (1933).

Phalut–Chia Bhanjang, 3100–3600 m (May 11, 1960, no. 245); Jongri, 4000 m (May 23, 1960); Jongri–Gamothang, 3600–4200 m (May 26, 1960); Migothang–Nayathang, 3500–3900 m (Jun. 1, 1960); Chia Bhanjang–Phalut, 3100–3500 m (Jun. 2, 1960); Phalut, 3500 m (Jun. 3, 1960, no. 638 & Jun. 5, 1960); Thakma Khola–Diorali Bhanjang, 3000 m (Nov. 14, 1963).

Distr. Himalaya to W. China (Szechuan, Yunnan).

Crypsinus oxylobus (Wall. ex Kunze) Sledge in Bull. Brit. Mus. Bot. **2**: 145 (1960).

Polypodium trifidum D. Don, Prodr. Fl. Nepal. 3 (1825); non Hoffm. (1790).

Polypodium oxylobum Wall. ex Kunze in Linnaea **24**: 255 (1851).

Phymatodes oxyloba (Wall. ex Kunze) Presl ex Ching in Contr. Inst. Bot. Nat. Acad. Peiping **2**: 67 (1933).

Palmajua–Rimbick, 2200–2300 m (May 5, 1960).

Distr. Himalaya to SW. China.

Crypsinus quasidivaricatus (Hayata) Copel., Gen. Fil. 206 (1947).

Polypodium dicaricatum Hayata in Bot. Mag. Tokyo **23**: 78 (1909); non Fourn. (1872).

Polypodium quasidivaricatum Hayata, Mat. Fl. Formos. 446 (1911), based on *P. divaricatum* Hayata.

Phymatodes quasidivaricata (Hayata) Ching in Contr. Inst. Bot. Nation. Acad. Peiping **2**: 87 (1933).

Phymatodes Stracheyi Ching, l.c. 83 (1933).

Hati Sar–Minchin Dhap, 2500–3000 m (Oct. 28, 1963); Minchin Dhap–Mul Pokhari, 2500–3000 m (Oct. 29, 1963).

Distr. Himalaya east to China, and Formosa.

Crypsinus Stewartii (Bedd.) Copel., Gen. Fil. 206 (1947).

Pleopeltis Stewartii Bedd., Ferns Brit. Ind. pl. 204 (1867).

Phymatodes Stewartii (Bedd.) Ching in Contr. Inst. Bot. Nat. Acad. Peiping **2**: 81 (1933).

Nayathang–Phalut, 3100 m (Jun. 2, 1960, no. 752); Senchal–Tiger Hill, 2400–2500m (Jun. 23, 1960); Bilbatay Bhanjang–Hati Sar, 2500–3000 m (Oct. 27, 1963).

Distr. Himalaya to W. China (Yunnan).

Ctenopteris subfalcata (Blume) Kunze in Bot. Zeit. **6**: 120 (1848).

Polypodium subfalcatum Blume, Enum. Pl. Jav. **2**: 130 (1828)–Bedd., Handb. 314 (1883).

Senchal, 2300 m (Apr. 10, 1960); Takdah, 1600 m (Apr. 18, 1960, no. 1998), & (Apr. 19, 1960); Rimbick–Ramam, 1900–2000 m (May 7, 1960 no. 143); Bakkim–Jongri, 2200–4000 m (May 20 1960, no. 403); Garibans, 2800 m (Jun. 7, 1960). Mul Pokhari–Dumhan, 2200 m (Oc. 30, 1963); Thakma Khoba, 3000 m (Nov. 13, 1963); Thakma Khola–Yamphodin, 2500–3000 m (Nov. 13, 1963); Thakma Khola–Diorali Bhanjang, 3100 m (Nov. 14, 1963); Baroya Khimty–Thakma Khola, 2500–3000 m (Nov. 16, 1963); Khebang–below Siling Tzokupa (Nov. 20, 1963); Birwa–Yektin, 1000–2000 m (Nov. 28, 1963); Batasay–Bhuspate Danra, 2200–2600 m (Dec. 1, 1963).

Distr. Himalaya through China to Formosa, south to Ceylon and Malaysia.

Drynaria propinqua (Wall. ex Mett.) J. Sm. apud Bedd., Ferns Brit. India pl. 160 (1866); Handb. 339, f. 189 (1883)–Nayar in Bull. Bot. Gard. Lucknow no. **56**: 9 (1961).

Polypodium propinquum Wall. ex Mett. in Abh. Senckenb. Naturforsch. Ges. **2**: 120, t. 3, f. 50 (1857).

Happy Valley, 1900 m (Apr. 16, 1960); Peshok, 900 m (Apr. 27, 1960); Pamianchi, 2000m (May 13, 1960); Gangtok–Saramsa Medicinal Garden, 1000m (Jun. 17, 1960); Phusri–Dhara Pani, 500–1200 m (Oct. 16, 1963); Dumhan–Taplejung, 700–1700 m (Nov. 1, 1963); Taplejung–Garhi Danra, 1700–2000 m (Nov. 3, 1963); Garhi Danra–Tuwa, 1500–2000 m (Nov. 4, 1963); Tuwa–Taplethok, 1300–1600 m (Nov. 5, 1963); Taplethok–Helok, 1400–1500 m (Nov. 6, 1963); Helok–Iladanda, 1500–1800 m (Nov. 8, 1963); Helok, 1500m (Nov. 9, 1963); below Siling Tzokupa–Khebang, 1700–2000 m (Nov. 22, 1963).

Distr. N. India and Burma to S. China, also reported from C. China.

Drynaria quercifolia (L.) J. Sm. in Journ. Bot. **3**: 398 (1841)–Bedd., Handb. 341 (1883)–Nayar, l.c. 11 (1961).

Polypodium quercifolium L., Sp. Pl. ed. 1, **2**: 1087 (1753).

Tista, Darjeeling, 350 m (Jun. 20, 1960); Dhara Pani–Dhankuta, 500–1000 m, (Oct. 17, 1963).

Distr. Throughout India in the plains and Ceylon, east to S. China, and south to Fiji, and tropical Australia.

Lemmaphyllum carnosum (J. Sm.) Presl, Epim. Bot. 158 (1849)–C. Chr. in Dansk Bot. Ark. **6** (3): 49 (1929)–Ching in Bull. Fan Mem. Inst. Biol. **4**: 103 (1933).

Drymoglossum carnosum J. Sm. in Hook., Gen. Fil. pl. 78 A (1841).

Taplethok–Helok, 1500 m (Nov. 6, 1963).

Distr. Sikkim, Khasia, Tonkin, N. Thai, and W. China (Yunnan, Kwangsi).

Lemmaphyllum rostratum (Bedd.) Tagawa, comb. nov.

Polypodium rostratum Hook., Icon. Pl. pl. 953 (1854); non Burm. f. (1768) nec alior.

Pleopeltis rostrata Bedd., Ferns Brit. Ind. pl. 159 (1867), a legitimate name based on *Polypodium rostratum* Hook.; Handb. 345 (1883).

Polypodium subrostratum C. Chr., Ind. Fil. 567 (1906), a substitute name for *Polypodium rostratum* Hook.

Lemmaphyllum subrostratum (C. Chr.) Ching in Bull. Fan Mem. Inst. Biol. **4**: 97 (1933); Icon. Fil. Sin. **2**: pl. 77 (1934).

Lepisorus subrostratus (C. Chr.) C. Chr. et Tard. in Not. Syst. **8**: 187 (1939).

Lepidogrammitis subrostrata (C. Chr.) Ching in Sunyatsenia **5**: 258 (1940).

Takdah, Darjeeling, 1600–1700 m (Apr. 19, 1960, no. 2146); Pamianchi, 2000 m (May 13, 1960); Iladanda–Selap, 2000–2500 m (Nov. 9, 1963); Iladanda–Helok, 1500–2000 m (Nov. 13, 1963).

Distr. N. India to SW. China, south to Indo-China.

Lepisorus contortus (Christ) Ching in Bull. Fan Mem. Inst. Biol. **4**: 90 (1933); Icon. Fil. Sin. **2**: pl. 75 (1934).

Polypodium lineare var. *contortum* Christ in Nuov. Giorn. Bot. Soc. Ital. n.s. **4**: 98 (1897).

Pleopeltis contorta (Christ) Alston et Bonner in Candollea **15**: 209 (1956).

Birch Hill, Darjeeling, 2000 m (Apr. 9, 1960); St. Paul Hill, 2200 m (Apr. 10, 1960); Ratong Chu–Yoksam, 1000–1700 m (May 16, 1960).

Distr. Himalaya to China.

Lepisorus loriformis (Wall. ex Mett.) Ching in Bull. Fan Mem. Inst. Biol. **4**: 81 (1933); Icon. Fil. Sin. **2**: pl. 61 (1934).

Polypodium loriforme Wall. ex Mett. in Abh. Senckenb. Naturforsch. Ges **2**:. 92 (1857).

Pleopeltis loriformis (Wall. ex Mett.) Alston et Bonner in Candollea **15**: 208 (1956).

Senchal, Darjeeling (Apr. 16, 1960, no.. 1970); Palmajua–Rimbick, 2200–2300 m (May 5, 1960); Pamianchi, 2000 m (May 14, 1960); Yoksam, 1700–2200 m (May 17 & 18, 1960); Bakkim–Jongri, 2200–3000 m (May 30, 1960); Garibans, 2800 m (Jun. 7, 1960). Bilbatay Bhanjang–Hati Sar, 2200–1900 m (Oct. 27, 1963); Minchin Dhap–Mul Pokhari, 2500–3000 m (Oct. 29, 1963); Mul Pokhari–Nissim, 2000 m (Oct. 30, 1963); above Lelep, 2500 m (Nov. 9, 1963); Selap–Walunchung Gola, 2200–3200 m (Nov. 10, 1963); Helok–Baroya Khimty, 1500–2500 m (Nov. 10, 1963); Baroya Khimty, 2500 m (Nov. 11, 1963); Iladanda–Helok (Nov. 13, 1963); Thakma Khola, 3000 m (Nov. 13, 1963); Baroya Khimty–Thakma Khola, 2500–3000 m (Nov. 16, 1963); Birwa–Yektin, 1500–2000 m (Nov. 28, 1963); Batasay–Bhuspate Danra, 2300–2700 m (Dec. 1, 1963); Bhuspate Danra, 2000 m (Dec. 2, 1963).

Distr. Himalaya, Tibet, N. Burma, and W. China (Yunnan).

Lepisorus nudus (Hook.) Ching in Bull. Fan Mem. Inst. Biol. **4**: 83 (1933).

Pleopeltis nuda Hook., Exot. Fl. pl. 63 (1823).

Senchal, Darjeeling (Apr. 6, 1960); Kurseong, 1600 m (Apr. 12, 1960); Takdah, 1600–1700 m (Apr. 19, 1960); Rimbick (May 5, 1960); Penlong La, Gangtok, 2100 m (Jun. 16, 1960).

Distr. Himalaya to China.

Lepisorus Scolopendrium (Ham. ex D. Don) Tagawa, comb. nov.

Polypodium Scolopendrium Ham. ex D. Don, Prodr. Fl. Nepal. 1 (1825).

Lepisorus excavatus var. *Scolopendrius* (Ham. ex Don) Ching in Bull. Fan Mem. Inst. Biol. **4**: 69 (1933).

Pleopeltis Scolopendria (Ham. ex Don) Alston et Bonner in Candollea **15**: 207 (1956).

Gangtok, 1600 m (Jun. 15, 1960); Sinduwa, 2100 m (Oct. 24, 1963); Bilbatay Bhanjang, 2200 m (Oct. 25, 1963).

Distr. Himalaya, Tibet, and W. China (Yunnan).

Lepisorus sublinearis (Baker ex Takeda) Ching in Bull. Fan Mem. Inst. Biol. **4**: 78 (1933); Icon. Fil. Sin. **2**: pl. 59 (1934).

Polypodium sublineare Baker ex Takeda in Not. Bot. Gard. Edinb. **8**: 276 (1915).

Takdah, Darjeeling, 1600 m (Apr. 19, 1960); Pamianchi–Tingling Bridge, 1000–2000 m (May 15, 1960); Phusri–Dhara Pani, 500–1000 m (Oct. 16, 1963); Garhi Danra–Tuwa, 1500 m (Nov. 4, 1963); Ghatte–Khebang, 1500–2000 m (Nov. 19, 1963); below Siling Tzokupa–Khebang (Nov. 22, 1963).

Distr. Himalaya, Burma, and S. W. China.

Loxogramme grammitoides (Bak.) C. Chr., Ind. Fil. Suppl. **2**: 21 (1917); Ching, Icon. Fil. Sin. **4**: pl. 189 (1937).

Gymnogramme grammitoides Bak. in Journ. Bot. **27**: 178 (1889).

Garibans, Darjeeling, 2800 m (Jun. 7, 1960).

Distr. Himalaya to China and Japan. The first record for N. India.

Loxogramme involuta (D. Don) Presl, Tent. Pterid. 215 (1836)–Bedd., Handb. 393 (1883).

Grammitis involuta D. Don, Prodr. Fl. Nepal. 14 (1825).

Takdah, Dharjeeling, 1600 m (Apr. 19, 1960, no. 2161); Pamianchi–Tingling Bridge, 2000–1000 m (May 15, 1960); Tingling Bridge–Yoksam, 1000–1700 m (May 16, 1960, nos, 298, 319); Gangtok–Saramsa Medicinal Garden, 800 m (Jun. 17, 1960); Tuwa–Taplethok, 1400–1600 m (Nov. 5, 1963); Taplethok–Helok, 1400–1500 m (Nov. 6, 1963); below Siling Tzokupa–Khebang, 1500–2000 m (Nov. 22, 1963).

Distr. Himalaya, India, Ceylon, east to Burma, Thai, and Indo-China. It is uncertain whether this species occurs in China or not.

Loxogramme salicifolia (Makino) Makino in Bot. Mag. Tokyo **19**: 138 (1905)–C. Chr. in Contr. U. S. Nation. Herb. **26**: 324 (1931)–Ching, Icon. Fil. Sin. **4**: pl. 190 (1937)–Tagawa in Act. Phytotax. Geobot. **13**: 125 (1943).

Gymnogramme salicifolia Makino, Phan. Pter. Jap. Icon. Ill. **1**: pl. 34 (1899).

Takdah, Darjeeling, 1600–1700 m (Apr. 18, no. 1991 & Apr. 19, 1960).

Distr. Himalaya and Assam, through China and Formosa to Ryukyu, Quelpaert, and Japan.

Microsorium cuspidatum (D. Don) Tagawa, comb. nov.

Polypodium cuspidatum D. Don, Prodr. Fl. Nepal. 2 (1825).

Polypodium lucidum Roxb. in Calcut. Journ. Nat. Hist. **4**: 486 (1844).

Phymatodes cuspidata (Don) J. Smith, Cat. Cult. Ferns 10 (1857)–Alston et Bonner in Candollea **15**: 206 (1956).

Polypodium leiorhizum Wall. ex Mett., Fil. Lips. 37 (1856).

Pleopeltis leiorhiza (Wall. ex Mett.) Moore, Ind. Fil. 346 (1862)–Bedd., Handb. 372 (1883).

Phymatodes lucida (Roxb.) Ching in Contr. Inst. Bot. Acad. Peiping **2**: 61 (1933).

Microsorium lucidum (Roxb.) Copel., Gen. Fil. 196 (1947).

Happy Valley, Darjeeling, 1900 m (Apr. 10, 1960); Takdah–Rayang (Apr. 20, 1960, no. 2183); Siliguri–Kurseong (Apr. 29, 1960); Tingling Bridge–Yoksam, 1000–1700 m (May 16, 1960, no. 331); Phusri–Dhara Pani, 500–1500 m (Oct. 16, 1963); Dhara Pani–Dhankuta (Oct. 17, 1963); Tuwa–Taplethok, 1400–1600m (Nov. 5, 1963); Ghatte–Khebang (Nov. 19, 1963); below Siling Tzokupa–Khebang, 1500–2000 m (Nov. 22, 1963); Tharpu–near Chyangthaphu, 1000–1200 m (Nov. 26, 1963); Illam–Ranga Pani, 300–1200 m (Dec. 8, 1963).

Distr. N. India to SW. China, also in Tonkin and Laos.

Microsorium dilatatum (Bedd.) Sledge in Bull. Brit. Mus. Bot. **2**: 143 (1960).

Polypodium dilatatum Wall. ex Hook., Sp. Fil. **5**: 85 (1863); non Hoffm. (1796) nec Liebm. (1849).

Pleopeltis dilatata Bedd., Ferns Brit. Ind. t. 122 (1866), a legitimate name based on *P. dilatatum* Wall. ex Hook.–Bedd, Handb. 367 (1883).

Polypodium euriphyllum C. Chr., Ind. Fil. 525 (1906), a substitute name of *P. dilatatum* Wall. ex Hook.

Microsorium Hancockii Ching in Bull. Fan Mem. Inst. Biol. **4**: 309 (1933), p.p.; not *Polypodium Hancockii* Baker, the source of the name.

Takdah, Darjeeling, 1600–1700 m (Apr. 19, 1960, no. 2144); Lopchu, 1500 m (Apr. 28, no. 2328 & Jun. 19, 1960).

Distr. N. India to SW. China, south to Ceylon and Malaya.

Microsorium Hancockii (Bak.) Ching from S. China, Formosa, and Ryukyu is united with *M. dilatatum* by most authors, but it differs from the latter by the smaller fronds with few pairs of pinnae below a distinct large terminal segment.

Microsorium membranaceum (D. Don) Ching in Bull. Fan Mem. Inst. Biol. **4**: 309 (1933).

Polypodium membranaceum D. Don, Prodr. Fl. Nepal. 2 (1825).

Pleopeltis membranacea (D. Don) Moore, Ind. Fil. 191 (1860)–Bedd., Handb. 355 (1883).

Gangtok, 1000 m (Jun. 15, 1960); Happy Valley, Darjeeling, 1900 m (Jun. 26, 1960); Phusri–Dhara Pani, 500–1200 m (Oct. 16, 1963); Dhankuta–Murhay, 1000–2000m (Oct. 23, 1963); Sinduwa, 2100 m (Oct. 23 & 24, 1963); Taplethok–Helok, 1500m (Nov. 6, 1963).

Distr. India and Ceylon to S. China and Formosa, also in Tonkin, Laos, N. Thai and Philippines.

Microsorium punctatum (L.) Copel. in Univ. Calif. Publ. Bot. **16**: 111 (1929)–Ching in Bull. Fan Mem. Inst. Biol. **4**: 307 (1933).

Acrostichum punctatum L., Sp. Pl. ed. 2, **2**: 1524 (1763).

Pleopeltis punctata (L.) Bedd., Ferns Brit. Ind. Suppl. 22 (1876); Handb. 357 (1883).

Tista, Darjeeling, 350 m (Apr. 21, 1960, no. 1896).

Distr. Widely spread throughout the Old World tropics.

Neocheiropteris normalis (D. Don) Tagawa in Journ. Jap. Bot. **27**: 217 (1952).

Polypodium normale D. Don, Prodr. Fl. Nepal. 1 (1825).

Pleopeltis normalis (D. Don) Moore, Ind. Fil. 347 (1862)–Bedd., Handb. 353 (1883).

Microsorium normale (D. Don) Ching in Bull. Fan Mem. Inst. Biol. **4**: 299 (1933).

Neolepisorus normalis (D. Don) Ching in Bull. Fan Mem. Inst. Biol. **10**: 13 (1940).

Ghum, 2300 m (Apr. 4, 1960); Kurseong, 1600 m (Apr. 12, 1960); Senchal–Takdah, 1600–2000 m (Apr. 17, 1960); Takdah, 1600– 1700 m (Apr. 18, 1960, no. 2101); Batasi, 2000 m (May 2, 1960); Tharpu–near Chyangthaphu, 1000–1200 m (Nov. 26, 1963); near Chyangthaphu–Birwa, 1000–2000 m (Nov. 27, 1963).

Distr. NE. India to S. China, and southward to Sumatra and Malaya.

Polypodium amoenum Wall. ex Mett. in Abh. Senckenb. Naturforsch. Ges. **2**: 80 (1857)–Ching in Contr. Inst. Bot. Nat. Acad. Peiping **2**: 43 (1933)–Icon. Fil. Sin. **2**: pl. 99 (1936).

Goniophlebium amoenum (Wall. ex Mett.) Bedd., Ferns Brit. Ind. t. 5 (1865); Handb. 317 (1883).

Kurseong, Darjeeling, 1550m (Apr. 12, 1960); Mani Bhanjang–Batasi, 2000–2100 m (May 1, 1960, no. 4); Garibans, 2800 m (Jun. 7, 1960); Gangtok, 1600 m (Jun. 15, 1960); Penlong La, Gangtok, 2100 m (Jun. 16, 1960); Darjeeling, 2000 m (Jun. 24, 1960); Phusri–Dhara Pani, 500–1000 m (Oct. 16, 1963); Murhay–Bilbatay Bhanjang, 2000–2300 m (Oct. 24, 1963); Mul Pokhari–Dumhan, 1000–2300 m (Oct. 30, 1963); Taplejung–Garhi Danra, 1500–2000 m (Nov. 3, 1963); Tuwa–Taplethok, 1400–1600 m (Nov. 5, 1963); Baroya Khimty–Thakma Khola, 2000–3000m (Nov. 16, 1963); Ghatte, 1300 m (Nov. 17, 1963); Ghatte–Khebang, 1500–2000 m (Nov. 19, 1963).

Distr. Himalaya through China to Formosa, south to Indo-China and N. Thai.

Polypodium argutum Wall. ex Hook., Sp. Fil. **5**: 32 (1863)–Ching in Contr. Inst. Bot. Nat. Acad. Peiping **2**: 51 (1933).

Goniophlebium argutum (Wall. ex Hook.) Bedd., Ferns Brit. Ind. pl. 6 (1865); Handb. 323 (1883).

Dentam, Sikkim, 1500 m (May 11, 1960, no. 178); Senchal–Tiger Hill, 2400–2500 m (Jun. 23, 1960); Selap–Walunchung Gola, 2500–3000 m (Nov. 10, 1963); Murhay, 2000 m (Oct. 23, 1963); Sinduwa, Dhankuta Dist., 2100m (Oct. 23, 1963); Dhankuta–Murhay, 1500–2000 m (Oct. 23, 1963); Hati Sar–Minchin Dhap, 2500–3000 m (Oct. 28, 1963); Mul Pokhari–Dumhan, 1000–2000 m (Oct. 30, 1963).

Distr. Himalaya through China to Formosa, south to Indo-China and Philippines.

Polypodium lachnopus Wall. ex Hook., Icon. Pl. t. 952 (1854)–Ching in Contr. Inst. Bot. Nat. Acad. Peiping **2**: 48 (1933); Icon. Fil. Sin. **2**: pl. 95 (1936).

Goniophlebium lachnopus (Wall. ex Hook.) Bedd., Ferns Brit. Ind. pl. 163 (1866); Handb. 319 (1883).

Palmajua–Rimbick, 2200–2300 m (May 5, 1960); Penlong La, Gangtok, 2100 m (Jun. 16, 1960); Bilbatay Bhanjang, 2200 m (Oct. 25, 1963); Phusri–Dhara Pani, 500–1000 m (Oct. 16, 1963); Dumhan–Taplejung, 1000–1500 m (Nov. 1, 1963); Taplejung–Garhi Danra, 1500–2000 m (Nov. 3, 1963).

Distr. Himalaya, Khasia, and S. W. China.

Polypodium microrhizoma C. B. Clarke ex Baker in Hook. et Bak., Syn. Fil. ed. 2, 511 (1874)–Ching in Contr. Inst. Bot. Nat. Acad. Peiping **2**: 47 (1933); Icon. Fil. Sin. **2**: pl. 96 (1934).

Goniophlebium microrhizoma (Clarke ex Bak.) Bedd., Ferns Brit. Ind. Suppl. pl. 384 (1876); Handb. 322 (1883).

Birch Hill, Darjeeling, 2000 m (Jun. 18, 1960).

Distr. Himalaya to S. W. China, and Formosa.

Polypodium subamoenum C. B. Clarke in Trans. Linn. Soc. ser. 2, **1**: 550, pl. 82, f. 2 (1880)–Ching in Contr. Inst. Bot. Nat. Acad. Peiping **2**: 47 (1933).

Goniophlebium subamoenum (Clarke) Bedd., Handb. 317 (1883).

Chia Bhanjang–Phalut, 3100–3500 m (Jun. 2, 1960, no. 631); Phalut, 3500 m (Jun. 3, 1960); Minchin Dhap–Mul Pokhari, 2800 m (Oct. 29, 1963).

Distr. E. Himalaya, S. Tibet, and W. China (Yunnan).

Pyrrosia adnascens (Sw.) Ching in Bull. Chin. Bot. Soc. **1**: 45 (1935).

Polypodium adnascens Sw., Syn. Fil. 25, 222 (1806).

Niphobolus adnascens (Sw.) Kaulf.: Bedd., Handb. 325 (1833), p.p.

Pamianchi–Tingling Bridge, 1000–2000 m (May 5, 1960); Takdah–Rayang, 250 m (Apr. 20 & 26, 1960); Peshok, 900 m (Jun. 20, 1960); Dhara Pani–Dhankuta (Oct.

17, 1963); Bharomdin–Tharpu (Nov. 25, 1963).

Distr. India to S. China and Formosa, through Malaysia to Polynesia.

Pyrrosia Beddomeana (Gies.) Ching in Bull. Chin. Bot. Soc. **1**: 68 (1935).

Niphobolus Beddomeana Gies., Farngatt. Niphobolus 101 (1901).

Niphobolus stigmosus Bedd., Handb. 328 (1883), p.p.

Rayang, Darjeeling, 250 m (Apr. 20, 1960); Lopchu, 1500 m (Apr. 26, 1960); Tingling Bridge–Yoksam, 1000–1600 m (May 16, 1960); Phusri–Dhara Pani, 500–1000m (Oct. 16, 1963); Dhara Pani–Dhankuta, 300 m (Oct. 17, 1963); Bharomdin–Tharpu, 1000m (Nov. 25, 1963); Tharpu–near Chyangthaphu, 1000m (Nov. 26, 1963); Yektin, 1100 m (Nov. 29, 1963).

Distr. Himalaya to W. China (Yunnan).

Pyrrosia flocculosa (D. Don) Ching in Bull. Chin. Bot. Soc. **1**: 66 (1935).

Polypodium flocculosum D. Don, Prodr. Fl. Nepal. 1 (1825).

Niphobolus flocculosum (D. Don) Bedd., Ferns Brit. Ind. t. 162 (1866).

Dentam–Pamianchi, 1500–2000 m (May 12, 1960); Tingling Bridge–Yoksam, 1000–1700 m (May 16, 1960); Yoksam, 1700 m (May 17, 1960); Mul Pokhari–Dumhan (Oct. 30, 1963); Taplejung, 1700 m (Nov. 2, 1963); Garhi Danra–Tuwa, (Nov. 4, 1963); Tuwa–Taplethok, 1500 m (Nov. 5, 1963); Ghatte–Khebang, 1500–2000 m (Nov. 19, 1963).

Distr. Himalaya, Burma, to Tonkin and Annam.

Pyrrosia Heteractis (Mett. ex Kuhn) Ching in Bull. Chin. Bot. Soc. **1**: 57 (1935).

Polypodium Heteractis Mett. ex Kuhn in Linnaea **36**: 140 (1869).

Niphobolus Heteractis (Mett. ex Kuhn) J. Sm., Ferns Brit. & For. ed. 2, 296 (1877)–Bedd., Handb. 327 (1883).

Kurseong, Darjeeling, 1600 m (Apr. 12, 1960); Takdah, 1600 m (Apr. 19, 1960); Pamianchi–Tingling Bridge, 1000–2000 m (May 15, 1960); Taplethok–Helok, 1500 m (Nov. 6, 1963); Helok–Iladanda, (Nov. 8, 1963); Iladanda–Helok (Nov. 13, 1963); Ghatte–Khebang (Nov. 19, 1963).

Distr. Himalaya to W. China (Yunnan).

Pyrrosia Mannii (Gies.) Ching in Bull. Chin. Bot. Soc. **1**: 55 (1935).

Niphobolus fissus auct. non Blume; Bedd., Handb. 330 (1883), p.p.

Niphobolus Mannii Gies., Farngatt. Niphobolus 107 (1901).

Takdah, Darjeeling, 350 m (Apr. 19, 1960); Takdah–Rayang, 250m (Apr. 20, 1960); Kalimpong, 1300 m (Apr. 23, 1960); Chia Bhanjang–Dentam, 1500–2000m (May 11, 1960); Pamianchi–Tingling Bridge, 1000–2000 m (May 15, 1960); Yoksam, 1700 m (May 17, 1960); Mul Pokhari–Dumhan, 1000 m (Oct. 30, 1963); Dumhan, Taplejung Dist., by the Tamur River, 700 m (Oct. 31, 1963); Ghatte–Khebang, 1500–2000 m (Nov. 19, 1963); Khebang–Bharomdin, 1500m (Nov. 24, 1963); Bharomdin–Tharpu (Nov. 25, 1963); Tharpu–near Chyangthaphu, 1000–1500 m (Nov. 26, 1963); Illam–Ranga Pani, 500–1000 m (Dec. 8, 1963); Ranga Pani–Ghorwa, 300–700 m (Dec. 9, 1963).

Distr. Himalaya to N. Thai.

Pyrrosia mollis (Kunze) Ching in Bull. Chin. Bot. Soc. **1**: 53 (1935)–Sledge in Bull. Brit. Mus. Bot. **2**: 134 (1960).

Niphobolus mollis Kunze in Bot. Zeit. **6**: 121 (1848).

Niphobolus fissus auct. non Blume; Bedd., Handb. 330 (1883), p.p.

Yoksam, 1700 m (May 17, 1960); Dumhan–Taplejung, 1000–1500 m (Nov. 1, 1963).

Distr. Himalaya, Ceylon, India, and China.

Pyrrosia nuda (Gies.) Ching in Bull. Chin. Bot. Soc. **1**: 70 (1935).

Niphobolus nudus Gies., Farngatt. Niphobolus 149 (1901).

Takdah–Rayang, 250 m (Apr. 20, 1960); Mul Pokhari–Dumhan, 1000m (Oct. 30, 1963); Dumhan, 700 m (Oct. 31, 1963); Dumhan–Taplejung, 1000–1500 m (Nov. 1, 1963); Bharomdin–Tharpu (Nov. 25, 1963).

Distr. Himalaya to China.

Xiphopteris sikkimensis (Hieron.) Copel., Gen. Fil. 215 (1947).

Polypodium sikkimense Hieron. in Hedwigia **44**: 97 (1905).

Polypodium trichomanoides auct. non Sw.; Bedd., Handb. 308 (1883).

Baroya Khimty–Thakma Khola, 2500–3000 m (Nov. 12 & 16, 1963); Diorali Bhanjang–Bhandukay, 2500–3000 m (Nov. 14, 1963); Thakma Khola–Yamphodin, 2500–3000 m (Nov. 17, 1963).

Distr. Himalaya to W. China (Yunnan), and Tonkin.

VITTARIACEAE (by Hirosi Ito)

Antrophyum obovatum Bak. in Kew Bull. **1898**: 233 (1898).

Dentam–Pamianchi, 1500–2000 m (May 12, 1960).

Distr. Himalaya, India, Indo-China, China, Formosa, and Japan.

Antrophyum reticulatum (Forst.) Kaulf., Enum. Fil. 198 (1824)–Bedd., Handb. 401 (1883).

Hemionitis reticulata Forst., Fl. Ins. Austr. Prodr. 79 (1786).

Tuwa–Taplethok, 1800–1300 m (Nov. 5, 1963); Ghatte–Khebang, 1600–1700 m (Nov. 19, 1963).

Distr. India, Ceylon, Malay Peninsula, Malay Isls., Polynesia, tropical Australia, and Madagascar.

Vittaria elongata Sw., Syn. Fil. 109, 302 (1806)–Bedd., l.c. 404 (1883).

Takdah–Rayang, 250 m (Apr. 20, 1960); Rayang, 250 m (Apr. 21, 1960).

Distr. India, Ceylon, Burma, Indo-China, Malay Peninsula, S. China, Formosa, Philippines, Malay Isls., Polynesia, tropical Australia, and tropical Africa.

Vittaria flexuosa Fée, 3me Mém. 16 (1851)–Clarke in Trans. Linn. Soc. ser. 2, **1**: 574 (1880).

V. lineata (Sw.) sensu Bedd., Handb. 407 (1883)–Hope in Journ. Bombay Nat. Hist. Soc. **14**: 103 (1903).

Senchal, Darjeeling, 2300 m (Apr. 6, 1960); Victoria Fall, 1900 m (Apr. 10, 1960); St. Paul Hill, 2200 m (Apr. 10, 1960); Takdah, 1600–1700 m (Apr. 18, 1960); Lopchu, Darjeeling, (Apr. 28, 1960); Chia Bhanjang–Dentam, 2000–1600 m (May 11, 1960); Pamianchi–Gayzing Bazar, 2000–2700 m (May 13, 1960); Pamianchi–Tingling Bridge, 2000–1000 m (May 15, 1960); Ratong Chu–Yoksam, 1000–1700 m (May 16, 1960); Yoksam, 1700 m (May 17, 1960); Taplejung, 1700 m (Nov. 2, 1963); Garhi Danra–Tuwa, 2200–1800 m (Nov. 4, 1963); Tuwa–Taplethok (Nov. 5, 1963); Taplethok–Helok, 1300–1500 m (Nov. 6, 1963); Helok–Iladanda, 1500–1800 m (Nov. 8, 1963).

Distr. Africa, India, Burma, Indo-China, Malay, S. & C. China, Formosa, Korea, Japan, Philippines, Malay Isls., and New Guinea.

Vittaria Forrestiana Ching in Sinensia **1**: 191 (1931); Icon. Fil. Sin. **3**: t. 144 (1935).

Yoksam–Bakkim, 1700–2200 m (May 18, 1960); Preig Chu–Jongri, 2200–3000 m (May 19, 1960).

Distr. Himalaya (a new record), Burma, Indo-China, W. China (Yunnan), and Isl. Yakusima.

Vittaria himalayensis Ching in Sinensia **1**: 190 (1931)–Tagawa in Kitamura, Faun. & Fl. Nepal Himal. **1**: 81 (1955).

Bilbatay Bhanjang–Hati Sar, 2200–2700 m (Oct. 27, 1963); Ghatte–Khebang, 1600–1700 m (Nov. 19, 1963); Tharpu–near Chyangthaphu, 1200–1100 m (Nov. 26, 1963).

Distr. Himalaya (endemic).

Vittaria mediosora Hayata, Icon. Pl. Formos. **5**: 346 (1915).

Bakkim–Jongri, 2500–4000 m (May 19, 1960).

Distr. Himalaya (a new record), and Formosa.

Vittaria modesta Hand.-Mzt., Symb. Sin. **6**: 42 (1929).

Yoksam, Sikkim, 1700 m (May 17, 1960).

Distr. Himalaya (a new record), and S. & C. China.

Vittaria taeniophylla Copel. in Philip. Journ. Sci. **1**: Suppl. 2. 157 (1906).

Yoksam–Bakkim, 1700–2200 m (May 18, 1960); Preig Chu–Jongri, 2200–3000 m (May 19, 1960); Murhay–Bilbatay Bhanjang (Oct. 24, 1963); Sinduwa, 2100 m (Oct. 24, 1963); Bilbatay Bhanjang, 2200 m (Oct. 25 & 26, 1963); Bilbatay Bhanjang–Hati Sar, 2200–2700 m (Oct. 27, 1963); Hati Sar–Minchin Dhap, 2700–2800 m (Oct. 28, 1963); Mul Pokhari–Dumhan, 2400–700 m (Oct. 30, 1963); Selap–Walunchung Gola, 2600–3500 m (Nov. 10, 1963); Baroya Khimty, 2500 m (Nov. 11, 1963); Baroya Khimty–Thakma Khola, 2500–3300 m (Nov. 16, 1963); Thakma Khola–Yamphodin, 3300–2100 m (Nov. 17, 1963); Batasay–Bhuspate Danra, 2400–2900 m (Dec. 1, 1963); Bhuspate Danra, 2600 m (Dec. 2, 1963).

Distr. Himalaya (a new record), Philippines, and Formosa.

MARSILEACEAE (by Hirosi Ito)

Marsilea crenata Presl, Rel. Haenk. **1**: 84 (1825)–Holtt., Fl. Malaya **2**: 619 (1954).

Biratnagar, 200 m (Oct. 14, 1963); Sibganja–Gauriganja, 200 m (Dec. 12, 1963).

Distr. Himalaya (a new record), and Malaysia.

SALVINIACEAE (by Hirosi Ito)

Azolla imbricata (Roxb.) Nakai in Bot. Mag. Tokyo **39**: 185 (1925).

Salvinia imbricata Roxb. ex Griff. in Calcut. Journ. **4**: 470 (1844).

Mul Pokhari–Dumhan, 2400–700 m (Oct. 30, 1963); Bharomdin–Tharpu, 1000–1200 m (Nov. 25, 1963).

Distr. India, China, S. Korea, Formosa, Ryukyu, and S. Japan.

Salvinia natans (L.) All., Fl. Pedem. **2**: 289 (1785)–Stewart in Biologia **3** (2): 29 (1957).

Marsilea natans L., Sp. Pl. ed. 1, **2**: 1099 (1753).

Kathgara–Rangali, 200 m (Dec. 14, 1963).

Distr. Widely distributed in the warm regions of Europe to S. E. Asia.

BRYOPHYTA

ANTHOCEROTAE AND HEPATICAE (by Sinske Hattori)

I have named hitherto 55 genera and 199 species[1] of Hepaticae from the collections made by the members of Botanical Expeditions of the University of Tokyo in 1960 and 1963 to Sikkim and Nepal; but many additional hepatic collections still remain unnamed. Indeed the identification of Himalayan Hepaticae is never an easy task, because the Himalayas and the adjacent areas contain a number of little known species, most of which were described by Stephani (1898–1924) and Mitten (1861). Recently some critical studies have been published, which include, among others, Inoue's revisions of the Plagiochilaceae of southeastern Asia (1959, 1960, 1962, 1963, 1964, 1965 and 1965 a), Mizutani's studies on Indian species (1963) and on Southeast Asiatic species of Lejeuneaceae (1964, 1965), Amakawa's studies of Asiatic species of Jungermanniaceae (1963) and of Himalayan *Scapania* (1964), and Kuwahara's short survey of the Himalayan Metzgeriaceae.

I estimate that about 400 species of Hepaticae are in the present area, or about twice as many as are enumerated in this article. In such a situation it is almost impossible to discuss adequately the character of hepatic flora of the present area and its relations to the neighbouring regions. Therefore the following considerations are preliminary ones.

Among the 55 genera found in this area, a monotypic genus *Diplocolea* is endemic, and another monotypic *Delavayella* is restricted to the highlands of Northwest China and this area. The remaining 53 genera are also distributed in Japan, Europe and North America with the following exceptions: *Calycularia*, *Dicranolejeunea*, *Plagiochilion*, *Ptychanthus*, *Ptychocoleus*, *Spruceanthus*, *Trocholejeunea* and *Wiesnerella* are absent both from Europe and North America (excluding Mexico); *Cheilolejeunea*, *Lopholejeunea*, *Metacalypogeia* and *Pseudolepicolea*, from Europe; *Mastigophora*, from North America.

Among 199 species enumerated in this area, about 75 species (ca. 36%) have not yet been known elsewhere. I think most of these endemic species will be found also in highlands of Northwest China or other adjacent regions of Asia. About 35 other species are limited to this area and the Northwest Chinese highlands, excepting a very few species which also occur disjunctively in the highlands of Formosa (Taiwan). Thus a total of about 110 species (55%) are regarded to be Himalayan—Northwest Chinese highland species.

Among the remaining 90 species, those common to Japan are 72 species[2], about

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1) The 199 species include 9 new species and 37 species new to India; 15 species were reduced to synonymy and 17 are new combinations.

2) Thus 36% of the 199 species recorded in this area are common to Japan. Recently Pan-chieh and Pan-cheng (1969) studied the bryophytes of Mt. Hwangshan, 30°10′ N. Lat. and 118°11′ E. Long., 1860 m alt. *s. m.*, the highest mountain in East China. They record 70 species of Hepaticae there, 64 of which (90%) are common to Japan. The 90% against 36% clearly shows how closely the East Chinese bryoflora is related to the Japanese, whereas the Himalayan-Northwest Chinese highland bryoflora is decidedly different from that of Japan and her neighbouring regions.

40 of which are also distributed in Europe and/or North America, and about ten species of which are also known in Malaysia; those common to Malaysia are about 30 species, about ten of which have ranges extending northwards to Japan, as mentioned above. Thus, the hepatic flora of the present area includes (1) about 110 Himalayan—Northwest Chinese highland species, (2) about 20 East Asian temperate species (occurring in China, in particular the eastern part, to Japan except high mountains, but not in Europe or North America, nor in Malaysia), (3) about 40 boreal species (common to Europe and/or North America), and (4) about 30 Malaysian species (Asian tropical—subtropical, often extending northwards to Japan along the Pacific coast). However, since the above is a rough outline, I mention below some phytogeographically important species.

Anastrophyllum Joergensenii, *Mastigophora Woodsii*, *Plagiochila Carringtonii* (=*Jamesoniella Carringtonii*) and *Scapania nimbosa* were well known only from very limited areas along the Atlantic coast of England and Norway, and *Anastrophyllum Donianum* and *Herberta Sendtneri* were known there also and disjunctively in the European Alps. Recently all six of these species have been found in the present area and also in Yunnan and Szechuan of China, where they are well-developed, frequently bearing perianths and other sexual organs, whereas in Europe they are mostly in the sterile state. Other widely but disjunctively distributed species found in this area include, among others, *Acrobolbus ciliatus*, *Bazzania Pearsonii*, *Pleurozia purpurea*, and *Pseudolepicolea Trollii*. *Acrobolbus ciliatus* is known in Eastern Himalayas, Formosa, Japan (montane areas of paleozoic rocks), and in the southern Appalachians (Great Smoky Mts.). *Pseudolepicolea Trollii* was found in Sikkim, Yunnan, Szechuan, Formosa, Japan (Kurobe Valley) and in North Borneo (Mt. Kinabalu). As for important endemic species we may enumerate *Bazzania imbricata*, *Delavayella serrata*, *Diplocolea sikkimensis*, *Lophozia setosa*, *Scapania Harae* and many others. One of the most important species which I could not find in our collections may be *Takakia ceratophylla* (Mitt.) Grolle. This is the second species of *Takakia* and is known to occur only at Lachen in the present area, whereas *Takakia lepidozioides* has been known in Japan (N. Japan Alps), Queen Charlotte Islands, British Columbia, and in North Borneo (Mt. Kinabalu). Thus, the present area could be considered to be a center of temperate Eurasian bryoflora, containing very many of the elements which may represent relicts of the Tertiary or pre-Tertiary hepatic flora.

Prof. H. Hara of University of Tokyo provided these interesting collections of Himalayan Hepaticae for our studies. Many colleagues helped me with the identification or verification of almost all of the collections of the following groups: Dr. M. Mizutani of Hattori Botanical Laboratory, the families, Lejeuneoideae and Lepidoziaceae; Dr. H. Inoue of National Science Museum, Tokyo, all of the big genus, *Plagiochila*; Dr. T. Amakawa of Shuyukan Senior High School, Fukuoka, the genera, *Scapania* and *Jungermannia*; and Dr. N. Kitagawa of Nara Teachers College, the family, Lophoziaceae, and the genus, *Marsupella*. Besides, Dr. M. Kamimura, Kochi, checked some *Frullania* collections. Prof. A. J. Sharp of University of Tennessee read the manuscript and gave me editorial aid. To all these persons and others who helped me in many ways I express here my deep

gratitude.

Class. Anthocerotae

ANTHOCEROTACEAE

Notothylas Levieri Schiffn. ex Steph., Sp. Hepat. **5**: 1021 (1917).

Ghatte–Khebang, 1600–2200 m (Nov. 19, 1963; no. 237009).

Distr. Himalaya, and Bengal.

Class. Hepaticae

HERBERTACEAE

Herberta ceylanica (Steph.) H. A. Miller in Journ. Hattori Bot. Lab. **28**: 308 (1964).

Preig Chu–Jongri, 2200–4000 m (May 19, 1960); Jongri, 4000 m (May 21, 1960).

Distr. E. Himalaya, and Ceylon. New to Himalaya.

Herberta chinensis Steph. in Hedwigia **34**: 43 (1895).

Phalut, 3550 m (May 10, 1960); Phalut–Dentam, 1450–3630 m (May 11, 1960); Jongri, 4000 m (May 22, 1960).

Distr. E. Himalaya, and China (Yunnan). New to Himalaya.

Herberta dicrana (Tayl.) Trev. in Mem. R. Istit. Lombardo Sci. **4**: 397 (1877)–*Sendtnera dicrana* Tayl. in Gott., Lindenb. & Nees, Syn. Hepat. 239 (1845)–*Schisma sikkimensis* Steph. (1909)–*Herberta sikkimensis* (Steph.) Nichols. (1930)–*Schisma Fleischeri* Steph. (1922)–*Herberta Fleischeri* (Steph.) H. A. Miller (1965)–*Schisma juniperinum* var. *sanguineum* Mont. (1841)–*Herberta sanguinea* (Mont.) Aust. (1879)–*Schisma nilgherriense* Steph. (1909)–*Herberta nilgherriensis* (Steph.) H. A. Miller (1965).

Phalut, 3550 m (May 10, 1960); Phalut–Dentam, 3630–1450 m (May 11, 1960).

Distr. Nepal, Sikkim, Darjeeling, and Nilghiri.

Herberta fragilis (Steph.) H. A. Miller in Journ. Hattori Bot. Lab. **28**: 311 (1965).

Tenzing Norkay Road–Birch Hill, 2000 m (Apr. 5 & 7, 1960); Kurseong, 1500 m (Apr. 12, 1960); Migothang–Nayathang, 3300–3900 m (Jun. 1, 1960); Darjeeling–Tiger Hill, 2000–2500 m (Jun. 23, 1960).

Distr. Sikkim.

Herberta himalayana (Steph.) H. A. Miller in Journ. Hattori Bot. Lab. **28**: 319 (1965).

Ramam–Phalut, 2200–3550 m (May 9, 1960); Jongri–Olothang, 3600–4000 m (May 23, 1960); Migothang–Nayathang, 3300–3900 m (Jun. 1, 1960).

Distr. Sikkim, and Darjeeling.

Herberta Kurzii (Steph.) H. A. Miller in Journ. Hattori Bot. Lab. **28**: 320 (1965)–*Schisma Kurzii* Steph., Sp. Hepat. **4**: 24 (1909)–*Herberta Handelii* Nichols. in Hand.-Mzt., Symb. Sin. **5**: 28 (1930), syn. nov.–*H. imbricata* Horik. in Journ. Sci. Hiroshima Univ. ser. b, div. 2, **2** (2): 207 (1934), syn. nov.

Jongri, 4000 m (May 20 & 22, 1960).

Distr. Himalaya, W. China (Yunnan), and Formosa.

Herberta mastigophoroides H. A. Miller in Journ. Hattori Bot. Lab. **28**: 324 (1965).

Kurseong, 1550 m (Apr. 12, 1960).

Distr. Darjeeling.

Herberta Sendtneri (Nees) Evans in Bull. Torrey Bot. Cl. **44**: 212 (1917)-*Schisma Sendtneri* Nees, Naturg. Europ. Leberm. **3**: 575 (1838)-*H. Delavayi* Steph. in Hedwigia **34**: 43 (1895), syn. nov-*S. Delavayi* (Steph.) Steph., Sp. Hepat. **4**: 22 (1909), syn. nov.

Jongri–Choktschering Chu, 4000–4300 m (May 25, 1960).

Distr. Europe (Altantic coast and the Alps), Himalaya, and W. China (Yunnan).

PTILIDIACEAE

Mastigophora Woodsii (Hook.) Nees, Naturg. Europ. Leberm. **3**: 95 (1838)-*Jungermannia Woodsii* Hook., Brit. Jungerm. pl. 66 (1814)-*M. sikkimensis* Steph., Sp. Hepat. **6**: 368 (1922)-*M. Woodsii* var. *orientalis* Nichols. in Hand.-Mzt., Symb. Sin. **5**: 29 (1930), syn. nov.

Jongri, 4000 m (May 20, 1960); Hati Sar–Minchin Dhap, 2600–3000 m (Oct. 28, 1963); Thakma Khola–Yamphodin, 2100–3300 m (Nov. 17, 1963).

Distr. Scotland, Ireland, Faeroes, Himalaya, Bengal, and W. China (Yunnan).

TRICHOCOLEACEAE

Trichocolea tomentella (Whrh.) Dum., Comm. Bot. 113 (1822).

Sandakphu–Tonglu, 2600–3550 m (June 7, 1960); Hati Sar–Minchin Dhap, 2600–3000 m (Oct. 28, 1963); Taplejung, 1700 m (Nov. 1 & 2, 1963); Helok–Baroya Khimty, 1500–2500 m (Nov. 15, 1963); Baroya Khimty–Thakma Khola, 2500–3000 m (Nov. 16 & 17, 1963); Thakma Khola–Yamphodin, 2100–3300 m (Nov. 17, 1963); Yamphodin–Ghatte, 1600–2100 m (Nov. 18, 1963); Birwa–Yektin, 1200–2500 m (Nov. 28, 1963); Bhuspate Danra, 2600 m (Dec. 2, 1963).

Distr. Europe, Himalaya, China, Formosa, Japan, ?Java, ?Australia, and N. America.

BLEPHAROSTOMACEAE

Blepharostoma trichophyllum (L.) Dum., Rec. d'Obs. 18 (1835).

Jongri, 4000–4200 m (May 22, 1960); Jongri–Olothang, 3600–4000 m (May 23, 1960); Siling Tzokupa, 2000–3000 m (Nov. 21, 1963).

Distr. E. Africa, Europe, Himalaya, China, Formosa, Japan, Korea, Siberia, and N. & C. America.

Pseudolepicolea Trollii (Herz.) Grolle et Ando in Hikobia **3**: 177 (1963)-*Blepharostoma Trollii* Herz. (1939)-*Lophochaete Trollii* (Herz.) Schust. (1960).

Sandakphu–Tonglu, 2800–3550 m (Jun. 7, 1960).

Distr. Darjeeling, Sikkim, N. Borneo (Mt. Kinabalu), China (S. Szechuan), Formosa, and Japan (Kurobe valley).

In Borneo this species is known only from Mt. Kinabalu at an elevation of 3000 m above sea level near Paca Cave, where it associates with *Takakia lepidozioides* Hatt. et Inoue. *Lophochaete Andoi* Schust. is better treated as a variety of the present species: *Pseudolepicolea Trollii* (Herz.) Grolle et Ando var. *Andoi* (Schust.) Hatt., comb. nov. (*Lophochaete Andoi* Schust. in Journ. Hattori Bot. Lab. **23**: 199, 1960).

LEPIDOZIACEAE

Bazzania appendiculata (Mitt.) Hattori, comb. nov.–*Mastigobryum appendiculatum* Mitt. in Journ. Linn. Soc. **5**: 105 (1861).

Tingling Bridge–Yoksam, 1000–1700 m (May 16, 1960).

Distr. Sikkim, and Assam.

Bazzania decurva (Nees) Trev. in Mem. R. Ist. Lombardo ser. 3, **4**: 414 (1877).

Pamianchi–Gayzing Bazar, 1500–2000 m (May 13, 1960); below Bakkim–Jongri, 2200–4000 m (May 19, 1960); Sandakphu–Tonglu, 2800–3550 m (Jun. 7, 1960); Hati Sar–Minchin Dhap, 2600–3000 m (Oct. 28, 1963); Selap–Walunchung Gola, 2600–3200 m (Nov. 10, 1963); Helok–Baroya Khimty, 1500–2500 m (Nov. 15, 1963); Baroya Khimty–Thakma Khola, 2500–3000 m (Nov. 16, 1963); Siling Tzokupa, 2000–3000 m (Nov. 21, 1963).

Distr. E. Nepal, Sikkim, India, and Ceylon.

Bazzania himalayana (Mitt.) Schiffn. in Oesterr. Bot. Zeitschr. **49**: 132 (1899)–*Mastigobryum himalayanum* Mitt. in Journ. Linn. Soc. **5**: 105 (1861).

Senchal–Tiger Hill, 2500 m (Apr. 16, 1960); Rimbick, 2200 m (May 6, 1960); Pamianchi–Gayzing Bazar, 1550–2000 m (May 13, 1960); Tingling Bridge–Yoksam, 1000–1700 m (May 16, 1960); below Bakkim–Jongri, 2200–4000 m (May 19, 1960).

Distr. Sikkim, and Bengal.

Bazzania imbricata (Mitt.) Hattori, comb. nov.–*Mastigobryum imbricatum* Mitt. in Journ. Linn. Soc. **5**: 104 (1861).

Phalut, 3550 m (May 10 & 12 & Jun. 5, 1960); below Bakkim–Jongri, 2200–4000 m (May 19, 1960); Preig Chu–Jongri, 2500–4000 m (May 19, 1960); Jongri, 4000–4200 m (May 20 & 22, 1960); Jongri–Olothang, 3600–4000 m (May 23, 1960); Migothang, 3900 m (May 29, 1960); Migothang–Nayathang, 3300–3900 m (Jun. 1, 1960); Hati Sar–Minchin Dhap, 2600–3000 m (Oct. 28, 1963); Taplejung, 1700 m (Nov. 1/2, 1963); Selap–Walunchung Gola, 2600–3200 m (Nov. 10, 1963); Siling Tzokupa, 2000–3000 m (Nov. 21, 1963).

Distr. E. Nepal, and Sikkim.

This species is very remarkable, when well-developed, with large, imbricate underleaves whose margin is lobulate, and seems to be rather common in the present region, though it has been found nowhere else. We may regard this species as one of the representative Hepaticae in this area.

Bazzania lobulistipa (Steph.) Hattori, comb. nov.–*Mastigobryum lobulistipum* Steph., Sp. Hepat. **3**: 462 (1908).

Kurseong, 1550 m (Apr. 12, 1960); Lopchu, 1500 m (Apr. 28, 1960); below Bakkim–Jongri, 2200–4000 m (May 19, 1960); Lower Road, Rabong La–Temi, 1000–1300 m (Mar. 28, 1963); Walunchung Gola, 2600–3200 m (Nov. 10, 1963); Walunchung Gola–Zongi, 2700–3800 m (Nov. 11, 1963); Zongi–Iladanda, 1800–2700 m (Nov. 12, 1963).

Distr. E. Himalaya, and Assam.

Bazzania Pearsonii Steph. in Hedwigia **32**: 212 (1893)–*Mastigobryum Pearsonii* (Steph.) Steph., Sp. Hepat. **3**: 476 (1908)–*B. ampliata* Steph. ex Herz. in Ann.

Bryol. **12**: 78 (1939)–*B. trigona* Hatt. in Journ. Hattori Bot. Lab. **2**: 17 (1947).

Jongri, 4000–4200 m (May 20 & 22, 1960).

Distr. Himalaya, Japan, Alaska, Ireland, and Scotland.

This species shows a wide but disjunctive distribution in the Northern Hemisphere. *Bazzania ampliata* described from Sikkim and *B. trigona* described from Yakushima I., Japan are both synonymous under the present species.

Bazzania pinniformis (Steph.) Hattori, comb. nov.–*Mastigobryum pinniforme* Steph., Sp. Hepat. **6**: 477 (1924).

Ghatte–Khebang, 1600–2200 m (Nov. 19, 1963; no. 237000).

Distr. E. Nepal, Sikkim, and Bengal.

Bazzania pusilla (Steph.) Hattori, comb. nov.–*Mastigobryum pusillum* Steph., Sp. Hepat. **6**: 477 (1924).

Senchal–Tiger Hill, 2500 m (Apr. 16, 1960); Happy Valley near Darjeeling (Jun. 26, 1960); Baroya Khimty–Thakma Khola, 2500–3000 m (Nov. 16, 1963).

Distr. India (sine loco speciali), Nepal, and Sikkim.

Bazzania sikkimensis Steph. in Schiffn. in Oesterr. Bot. Zeitschr. **49**: 203 (1899), sine descr.; Herz. in Ann. Bryol. **12**: 78 (1939), sine descr.–*Mastigobryum sikkimense* Steph., Sp. Hepat. **3**: 434 (1908).

Jongri, 4000–4200 m (May 20, 1960).

Distr. E. Himalaya (Sikkim, Darjeeling, Bhutan).

Bazzania tricrenata (Wahlenb.) Trev. in Mem. R. Ist. Lombardo ser. 3, **4**: 415 (1877).

Jongri, 4000–4200 m (May 20 & 21, 1960); Jongri–Olothang, 3600–4000 m (May 23, 1960); Migothang–Nayathang, 3300–3900 m (Jun. 1, 1960); Phalut, 3550 m (Jun. 5, 1960); Phalut–Sandakphu, 3200–3550 m (Jun. 6, 1960); Sandakphu–Tonglu, 2600–3550 m (Jun. 7, 1960).

Distr. Europe, Himalaya, China (Yunnan), Formosa, Korea, Japan, and N. America.

Kurzia Makinoana (Steph.) Grolle in Rev. Bryol. Lichenol. **32**: 171 (1963)–*Lepidozia Makinoana* Steph. in Bull. Herb. Boiss. **5**: 94 (1897)–*Microlepidozia Makinoana* (Steph.) Hatt. in Journ. Hattori Bot. Lab. **5**: 74 (1951).

Jongri, 4000–4200 m (May 22, 1960).

Distr. Europe, Sikkim, Formosa, Japan, and N. America. New to Sikkim.

Lepidozia erosa Steph., Sp. Hepat. **3**: 621 (1909).

Baroya Khimty–Thakma Khola, 2500–3000 m (Nov. 16, 1963; no. 236841); Yamphodin–Ghatte, 1600–2100 m (Nov. 18, 1963; no. 236987).

Distr. Sikkim, and Bengal.

Lepidozia reptans (L.) Dum., Rec. d'Obs. 19 (1835).

Selap–Walunchung Gola, 2600–3200 m (Nov. 10, 1963); Helok–Baroya Khimty, 1500–2500 m (Nov. 15, 1963); Baroya Khimty–Thakma Khola, 2500–3000 m (Nov. 16, 1963).

Distr. Europe, Kashmir, Himalaya, Japan, Saghalin, Siberia, and N. America.

Lepidozia robusta Steph. in Mem. Soc. Sci. Nat. Math. Cherbourg **29**: 217 (1894).

Jongri, 4000 m (May 20 & 21, 1960); Sandakphu–Tonglu, 2600–3550 m (Jun. 7, 1960).

Distr. Sikkim, Bengal, and China.

Lepidozia tridens Steph., Sp. Hepat. **3**: 616 (1906).

Phalut–Sandakphu, 3200–3550 m (Jun. 6, 1960; no. 201023); Sandakphu–Tonglu, 2800–3550 m (Jun 7, 1960; no. 201000).

Distr. Himalaya, and Bengal.

CALYPOGEIACEAE

Metacalypogeia alternifolia (Nees) Grolle in Oesterr. Bot. Zeitschr. **111**: 185 (1964)–*Mastigobryum alternifolium* Nees in Gott., Lindenb. & Nees, Syn. Hepat. 216 (1845)–*Calypogeia renistipula* (Schiffn.)–*C. Hartlessiana* Steph.–*C. remotifolia* Herz.–*Bazzania montana* Horik.–*Calypogeia verruculosa* Hatt.

Jongri, 4000 m (May 20, 1960); Sandakphu–Tonglu, 2800–3550 m (Jun. 7, 1960); Zongi–Iladanda, 1800–2700 m (Nov. 12, 1963); Thakma Khola–Yamphodin, 1800–2700 m (Nov. 12, 1963).

Distr. E. Himalaya, W. China (Yunnan, Szechuan), Formosa, and Japan.

LOPHOZIACEAE

Anastrepta orcadensis (Hook.) Schiffn. in Engl., Pfl.-fam. I, **3**: 85 (1893).

Jongri, 4000–4200 m (May 20–22, 1960); Jongri–Olothang, 3900–4000 m (May 23, 1960); Migothang–Nayathang, 3300–3900 m (Jun. 1, 1960); Phalut–Sandakphu, 3200–3550 m (Jun. 6, 1960); Walunchung Gola–Zongi, 2700–3800 m (Nov. 12, 1963).

Distr. Europe (Altantic coast and the Alps), Faeroes, Himalaya, W. China (Yunnan, Szechuan), Formosa, Japan, ?Siberia, N. America (Pacific coast of Alaska), and ?Hawaii.

This species is not considered to be a true arctic or boreal, but an alpine (and more or less oceanic) species. *Anastrepta sikkimensis* Steph., *A. erectifolia* (Steph.) Steph., *Lophozia decurrentia* Horik., and *L. rotundifolia* Horik. are all synonymous under the present species.

Anastrophyllum assimile (Mitt.) Steph. in Hedwigia **32**: 140 (1893).

Phalut, 3550 m (May 10, 1960; no. 201472); Migothang, 3900 m (May 29, 1960); no. 201662).

Distr. Europe (Norway, Alps), Himalaya (Nepal, Sikkim), Korea, Japan, and N. America (N. Pacific coast of Alaska, Queen Charlotte Is.).

European *Anastrophyllum Reichardtii* (Gott.) Steph. and two Japanese species, A. *japonicum* Steph. and *A. Tamurae* Steph. are all conspecific with the present species.

Anastrophyllum Donianum (Hook.) Steph. in Hedwigia **32**: 140 (1893).

Jongri, 4000–4200 m (May 20 & 22, 1960); Jongri–Olothang, 3600–4000 m (May 23, 1960); Migothang–Nayathang, 3300–3900 m (Jun. 1, 1960).

Distr. Europe, Himalaya, Bengal, and W. China (Yunnan).

In Europe this species is very rare, limited to Norway, Scotland and the Alps, whereas in this area it occurs frequently and well-developed.

Anastrophyllum Joergensenii Schiffn. in Hedwigia **49**: 396 (1910).

Jongri, 4000–4200 m (May 20 & 22, 1960); Jongri–Choktsering Chu, 4000–4300 m (May 25, 1960); Migothang–Nayathang, 3300 m (Jun. 1, 1960).

Distr. Europe, Himalaya (Nepal, Sikkim), and W. China (Yunnan).

This species had been known limitedly in the west coast of Europe where it is very rare before Grolle (1964) recorded it from Himalayas and Yunnan, synonymizing *Anastrophyllum alpinum* Steph. described from Sikkim under this species. As in the case of the preceding *A. Donianum*, it is not uncommon in this area.

Anastrophyllum (subg. Sphenolobus) **minutus** (Crantz) Schust. in Amer. Midl. Naturalist **42**: 576 (1949)-*Jungermannia minuta* Cr. in Dicks., Pl. Crypt. Brit. fasc. **2**: 13 (1790).

Jongri, 4000 m (May 21, 1960; no. 201206); Jongri-Olothang, 3600-4000 m (May 23, 1960; no. 201637).

Distr. Europe, Siberia, Japan, N. America, and ?S. Africa. New to Himalaya. Previously this species has been called *Sphenolobus minutus*.

Anastrophyllum piligerum (Reinw., Blume et Nees) Steph. in Hedwigia **32**: 140 (1893).

Below Bakkim-Jongri, 2200-4000 m (May 19, 1960; no. 200114); Jongri-Olothang, 3600-4000 m (May 23, 1960; no. 200153).

Distr. India, Ceylon, Sumatra, Borneo, Java, Philippines, Japan, Hawaii, ?Brasil, and ?Peru. New to Himalaya.

This is a tropical species widely distributed in Asia, and is very polymorphous. *Anastrophyllum Mayebarae* Hatt. described from Yakushima I. (Japan) is a form of this species occurring in the northernmost limit of its geographical range.

Chandonanthus birmensis Steph. in Bull. Soc. Bot. Belgique **38**: 43 (1899).

Darjeeling, 2000-2200 m (Apr. 2 & 7, 1960); Victoria Falls, Darjeeling, 1950 m (Apr. 2, 1960); Takdah-Rayang, 1600-2500 m (Apr. 20, 1960); Rayang, 2500 m (Apr. 21, 1960); Phalut-Sandakphu, 3200-3500 m (Jun. 6, 1960).

Distr. Madagascar, Himalaya, Burma, China, Java, Formosa, Ryukyu, and Japan.

The type material of this species shows the two antical leaf-lobes almost entire, lacking marginal teeth. But the above-cited materials, except nos. 201109 and 201785 (Victoria Falls), mostly have a few teeth along the margin of the antical lobes. Besides, I have seen more than ten other collections which seem to belong to this species but have more teeth along the margin of the antical or both antical and middle lobes, and may possibly be a not well-developed form of *Chandonanthus hirtellus* which is very common in this area, as cited below. Thus *C. birmensis* may be better treated as a variety of *C. hirtellus*, *C. hirtellus* var. *birmensis* (Steph.) Hattori, comb. nov.

Chandonanthus filiformis Steph., Sp. Hepat. **3**: 644 (1909).

Phalut, 3550 m (May 11, 1960); Jongri, 4000-4200 m (May 20 & 22, 1960); Jongri-Olothang, 3600-4000 m (May 23, 1960); Jongri-Choktsering Chu, 4000-4300 m (May 25, 1960); Jongri-Gamothang, 3750-4000 m (May 26, 1960); Migothang-Nayathang, 3300-3900 m (Jun. 1, 1960).

Distr. E. Himalaya, and China (Yunnan, Szechuan).

According to some literature this species does not occur in this region, but *Chandonanthus setiformis*, a closely allied European species, occurs here. However, I could not find *C. setiformis* in our collections nor others made in Eastern Himalaya.

Chandonanthus hirtellus (Web.) Mitt. in Journ. Linn. Soc. **22**: 321 (1887).

Senchal, 2400 m (Apr. 14, 1960); Darjeeling-Tiger Hill, 2150-2800 m (Apr. 16, 1960); Yoksam, 1700 m (May 17, 1960); Jongri, 4000–4200 m (May 20 & 22, 1960); Sandakphu–Tonglu, 2600–3550 m (Jun. 7, 1960); Hati Sar–Minchin Dhap, 2600–3000 m (Oct. 28, 1962); Walunchung Gola–Zongi, 2700–3800 m (Nov. 11, 1963); Baroya Khimty–Thakma Khola, 2500–3000 m (Nov. 12 & 16, 1963); Yamphodin–Ghatte, 1600–2100 m (Nov. 18, 1963); Batasay–Bhuspate Danra, 2300–2600 m (Dec. 1, 1963); Bhuspate Danra–Mai Majuwa, 1600–2900 m (Dec. 3, 1963); Mai Majuwa–Dhara Pani, 1500–1900 m (Dec. 4, 1963).

Distr. Warm-temperate–subtropical regions of Asia (including Himalaya, Yunnan, and Szechuan), New Guinea, Formosa, Japan, Pacific Is. (incl. Tahiti), Madagascar, and Africa.

This species is very variable particularly in the degree of development of marginal teeth of leaf-lobes.

Lophozia (subg. Massula) **incisa** (Schrad.) Dum., Rec. d'Obs. 17 (1835).

Phalut–Sandakphu, 3200–3550 m (Jun. 6, 1960).

Distr. Himalaya, Yunnan, Szechuan, Formosa, Japan, Korea, Siberia, Europe, and N. America.

Lophozia (subg. Lophozia) **longidens** (Lindb.) Macoun, Cat. Canad. Pls. **7**: 18 (1902)

Jongri, 4000 m (May 22, 1960; no. 201215); Phalut–Sandakphu, 3200–3500 m (Jun. 6, 1960; no. 201020).

Distr. Europe, Sikkim, Siberia, and N. America. New to Himalaya.

Lophozia (subg. Massula) **setosa** (Mitt.) Steph., Sp. Hepat. **2**: 151 (1901).

Jongri, 4000 m (May 22, 1960); Sandakphu–Tonglu, 2600–3550 m (Jun. 7, 1960).

Distr. Himalaya, and Yunnan.

This species may be one of the representative *Lophozia* of Himalaya–Yunnan bryoflora. The leaf-lobes have many marginal teeth. *Lophozia pluridentata* (Mitt.) Steph. (=*Jungermannia pluridentata* Mitt.) also described from Sikkim is identical to this species, as already pointed by Grolle (1964).

Lophozia (subg. Lophozia) **Wenzelii** (Nees) Steph. in Bull. Herb. Boiss. ser. 2, **2**: 35 (1902).

Jongri, 4000 m (May 22, 1960; nos. 201215, 201245).

Distr. Sikkim, Formosa, Siberia, Saghalin, and Alaska. New to Sikkim.

Kitagawa (1963) reduced *Lophozia formosana* Horik. described from Formosa to a synonym under the present species.

Tritomaria exsecta (Schmidel) Schiffn. in Ber. Nat. Med. Ver. Insbruck **31**: 12 (1908).

Phalut, 3550 m (Jun. 5, 1960; no. 201234); Zongi–Iladanda, 1800–2700 m (Nov. 12, 1963).

Distr. Europe, Madeira I., Himalaya, China, Formosa, Japan, Siberia, and N. America.

CEPHALOZIELLACEAE

Cephaloziella rubella (Nees) Warnst., Krypt. Fl. Mark Brandenburg **1**: 231 (1902).

var. **latiloba** N. Kitagawa, var. nov.

A typo differt lobis foliorum latioribus, 8–12 cellulas latis.

Jongri, 4000–4200 m (May 20, 1960; no. 201586—type in NICH, TI).

Distr. var. Endemic.

Cephaloziella subdentata Warnst., Krypt. Fl. Mark Brandenburg **1**: 234 (1902).

Phalut, 3550 m (May 10, 1960; no. 201526, planta dioica); Darjeeling, 2000 m (Dec. 31, 1963; no. 237589).

Distr. Europe, and E. Himalaya. New to Himalaya.

ACROBOLBACEAE

Acrobolbus ciliatus (Mitt.) Schiffn. in Engl., Pfl.-fam. I, **3**: 86 (1893).

Below Bakkim-Jongri, 4000 m; Phalut, 3500 m; Baroya Khimty–Thakma Khola, 2500–3000 m.

Distr. Himalaya, Formosa, Japan, and N. America (Appalachians).

The distribution of this species may be a good example of the disjunctive distributional patterns. This species was described from Sikkim, *Lophozia curiosissima* Horik. from Mt. Morrison, Formosa, *Leiocolea titibuensis* Hatt. [=*Acrobolbus titibuensis* (Hatt.) Hatt.] from Chichibu Mts., Japan, and *Acrobolbus rhizophorus* Sharp from Mt. LeConte, Great Smoky Mts., Appalachians. All of these four taxa are regarded to be conspecific with each other.

JUNGERMANNIACEAE

Diplocolea sikkimensis Amakawa in Journ. Jap. Bot. **37**: 274 (1962); in Journ. Hattori Bot. Lab. **26**: 21 (1963).

Jongri, 4000 m (May 21, 1960; no. 201225—type); Jongri–Gamothang, 3750–4000 m (May 26, 1960; nos. 201645, 201646).

Distr. Endemic.

This monotypic genus *Diplocolea* is still unknown elsewhere.

Jamesoniella autumnalis (D.C.) Steph. in Bull. Herb. Boiss. ser. 2, **1**: 1029 (1901).

Phalut, 3550 m (Jun. 5, 1960; no. 201234).

Distr. Sikkim, China, Korea, Japan, Siberia, Caucasus, Europe, and N. America. New to Himalaya.

Jamesoniella verrucosa Horik. in Journ. Sci. Hiroshima Univ. ser. b, div. 2, **2**: 146 (1934).

Jongri–Olothang, 3600–4000 m (May 13, 1960; no. 201243); below Bakkim-Jongri, 2200–4000 m (May 19, 1960; no. 201170).

Distr. Himalaya, and Formosa. New to Himalaya.

Jungermannia (subg. Solenostoma) **Decolyana** Schiffn. in Steph., Sp. Hepat. **6**: 85 (1917)-*Jungermannia* (subgen. Solenostoma) *clavellata* auct. non (Mitt. ex Steph.) Amak.: Amak. in Journ. Hattori Bot. Lab. **22**: 69 (1960).

Birch Hill, Darjeeling, 2000 m (Apr. 7, 1960); Jongri, 4000 m (May 22, 1960); Phalut, 3550 m (Jun. 5, 1960); Sandakphu–Tonglu, 2600–3550 m (Jun. 7, 1960).

Distr. Sikkim, and Bengal.

var. **minor** (Amak.) Amakawa, comb. nov.-*Jungermannia clavellata* (Mitt.) Amak. var. *minor* Amak. in Journ. Hattori Bot. Lab. **26**: 25 (1963).

Sandakphu–Tonglu, 2600–3550 m (Jun. 7, 1960.

Distr. Sikkim, and Nepal.

Jungermannia (subg. Solenostoma) **flaccidula** Amakawa, sp. nov.

Dioica, viridi-olivacea, ±flaccida, pulvinatim caespitosa, terricola; caulis 7 mm longus, 0.3 mm in diametro, repens, ±tener, cum foliis 2.4 mm latus, radiculis numerosis; folia caulina imbricata, oblique patula, saepe canaliculatim concava, in plano ovata vel ovato-oblonga, 1.5–1.9 (—2.7) mm longa, 1.4–1.6 mm lata; cellulae foliorum apicales 24–40 × 16–29 μ, mediae 40–56 × 24–35 μ, basales 48–96 × 24–32 μ, parietibus tenuibus, trigonis distinctis, acutis, cuticula aspera; perianthia ovata, semi-exserta, 1.4–1.6 mm longa, 0.8–1 mm lata, triplicata, ore brevissime rostrato; folia floralia caulinis minora, erecta, amplectantia. A *Jungermannia Schauliana* (Steph.) differt planta breviore et latiore, foliis imbricatis, ovatis-ovato-oblongis, trigonis cellularum acutis, minoribus.

Rayang, 2500 m (Apr. 18, 1960; no. 232512—type in herb. NICH; dupl. in TI).

Distr. Endemic.

Jungermannia (Plectocolea) **glauca** Amakawa, sp. nov.

Dioica, magna, glauca, ±hyalina; caulis ad 6 cm longus, 0.4–0.5 mm in diam., cum foliis 2.5–3 mm latus, ±tener, glaucus, erectus, radiculis pallidis, fasciculatim in caule decurrentibus; folia caulina laxe imbricata, oblique patula, canaliculatim concava, in plano orbiculata, 1.6–2 mm longa, 2–3.5 mm lata, saepe radiculifera; cellulae foliorum leptodermae, marginales 32–48 × 28–40 μ, mediae 40–80 × 40 μ, basales 80–140 × 40–60 μ, trigonis parvis, cuticula minute verrucosa; perianthia fusiformia, 1/2–1/3-exserta, 4 mm longa, 4-plicata, ore parvo, contracto; perigynium subnullum. A *Jungermannia tetragona* differt planta glauca, hyalina, foliis orbiculatis.

Baroya Khimty–Thakma Kola, 2500–3000 m (Nov. 16, 1963; no. 236837—type in herb. NICH; dupl. in TI; no. 236741).

Distr. Endemic.

Jungermannia (subg. Solenostoma) **koreana** (Steph.) Amakawa in Journ. Hattori Bot. Lab. **22**: 55 (1960).

var. **orbiculata** Amakawa., var. nov.

Dioica?, rubescens, in terra caespitosa; caulis 1 cm longus, 0.7 mm in diametro, cum foliis 1.2–1.6 mm latus, assurgens, radiculis longis, purpurascentibus; folia caulina remotiuscula, apicem sensim imbricata, oblique patula, ±concava, in plano orbiculata, 1–1.2 mm longa, 1.2–1.3 mm lata, fere cellulis magnis uniseriatis marginata; cellulae marginales 35–44 × 32–42 μ, parietibus validis, incrassatis, submarginales 32–40 × 32–35 μ, mediae 40–56 × 35–40 μ, basales 48–64 × 40 μ, parietibus tenuibus, trigonis acutis, cuticula levi; planta mascula gracillima, bracteis 3–4-jugis. A typo differt foliis orbiculatis.

Sandakphu–Tonglu, 2600–3500 m (Jun. 7, 1960; no. 241976—type in herb. NICH; dupl. in TI).

Distr. var. Endemic; distr. sp. Japan, and Korea.

Jungermannia (subg. Solenostoma) **lanigera** Mitt. in Journ. Linn. Soc. **5**: 91 (1861).

Sandakphu–Tonglu, 2600–3500 m (Jun. 7, 1960); Siling Tzokupa, 2000–3000 m (Nov. 21, 1963).

Distr. Sikkim, and Bengal.

Jungermannia (subg. Solenostoma) **purpurata** Mitt. in Journ. Linn. Soc. **5**: 91 (1861).

Phalut, 3550 m (Jun. 5, 1960; no. 200965).

Distr. Sikkim, and Khasia.

LOPHOCOLEACEAE

Chiloscyphus argutus (Reinw., Blume et Nees) Nees in Gott., Lindenb. et Nees, Syn. Hepat. 183 (1845).

Darjeeling–Lopchu, 1500–2000 m (Apr. 27, 1960); Yoksam–below Bakkim, 1700–2200 m (May 18, 1960); Penlong La, Gangtok, 2100 m (Jun. 16, 1960); Bhuspate Danra–Mai Majuwa, 1600–2900 m (Dec. 3, 1960).

Distr. India, China, Japan, and other regions of tropical to warm-temperate Asia, including New Guinea, and Pacific islands as Hawaii, ?New Zealand, and ?Australia.

Chiloscyphus Bescherellei Steph. in Bull. Herb. Boiss. **5**: 87 (1897)-*Chiloscyphus communis* Steph., Sp. Hepat. **3**: 211 (1907), syn. nov.

Senchal, 2300 m (Apr. 6, 1960); Sandakphu-Tonglu, 2800-3550 m (Jun. 7, 1960).

Distr. India, China, Japan, and other warm-temperate to tropical regions of Asia, extending to Philippines, New Guinea, and ?Australia.

Chiloscyphus coalitus (Hook.) Dum. is closely related to this species. The geographical area of *C. coalitus* covers New Zealand, Australia, and their adjacent islands, and the records of it from Asia may probably be caused by erroneous identifications.

Chiloscyphus flaccidus (Mitt.) Steph., Sp. Hepat. **3**: 210 (1907)-*Lophocolea flaccida* Mitt. in Journ. Linn. Soc. **5**: 99 (1861).

Ghum–Senchal, 2250 m (Apr. 4, 1960); Senchal–Tiger Hill (Apr. 16, 1960).

Distr. Sikkim, and Bengal.

Chiloscyphus polyanthus (L.) Corda in Opiz, Beitr. Naturf. **1**: 651 (1829).

Ghum–Senchal, 2250 (Apr. 4, 1960).

Distr. Europe, India, China, Formosa, Korea, Siberia, and N. America.

Chiloscyphus tener Steph., Sp. Hepat. **3**: 205 (1907)-*Saccogyna curiosissima* Horik. (fide Grolle 1960).

Senchal, 2400 m (Apr. 16, 1960); Phalut, 3550 m (May 10, 1960); Jongri, 4000 m (May 22, 1960); Nayathang–Chia Bhanjang, 3100–3300 m (Jun. 2, 1960).

Distr. Sikkim, Ceylon, China (Shensi), Formosa, Ryukyu, and Japan. New to Himalaya.

Lophocolea bidentata (L.) Dum., Rec. d'Obs. 17 (1835).

Penlong La, near Gangtok, 2100 m (Jun. 16, 1960; no. 237913).

Distr. Himalaya, Bengal, boreal regions of Asia, Europe, Africa, ?Java, ?New Zealand, ?Guadaloupe, N. America, and ?S. America.

Lophocolea minor Nees, Naturg. Europ. Leberm. **2**: 330 (1836).

Zongi–Iladanda, 1800–2700 m (Jun. 16, 1963; no. 236560).

Distr. China, Korea, Japan, Saghalin, Siberia, Europe, and N. America. New to Himalaya.

Lophocolea sikkimensis (Steph.) Grolle et Hatt., comb. nov.-*Herpocladium sikkimensis* Steph., Spec. Hepat. **6**: 349 (1922)-*Lophocolea Trollii* Herz. in Ann. Bryol. **12**: 77 (1939), syn. nov.

Jongri, 4000 m (May 22, 1960); Jongri-Olothang, 3600-4000 m (May 23, 1960); Sandakphu-Tonglu, 2800-3550 m (Jun. 7, 1960).

Distr. Sikkim, and Bengal.

Our collections include only male plants. The male inflorescence is terminal; bracts are in several pairs, closely imbricate, somewhat smaller than stem-leaves, but inflated, containing a single antheridium that is spherical, about 170 μ in diameter, and has a stalk composed of 2 rows of cells. Leaves are almost cordate below and shortly bilobed at apex, and the leaf-cells are 18-20 μ in middle, with large, acute to almost nodulose trigons. Underleaves are very large, similar to the leaves both in shape and size, and have a strong rhizoid-bundle at the base. For this peculiar, endemic species a new subgenus or at least a new section may be warranted.

DELAVAYELLACEAE

Delavayella serrata Steph. in Mem. Soc. Sci. Nat. Cherbourg **29**: 211 (1894).

Hati Sar-Minchin Dhap, 2600-3000 m (Oct. 28, 1963); Baroya Khimty-Thakma Khola, 2500-3000 m (Nov. 16, 1963); Thakma Khola-Yamphodin, 2100-3300 m (Nov. 17, 1963).

Distr. E. Himalaya, and W. China (Yunnan, Szechuan).

Nowellia orientalis Chopra (1938) and *N. indica* Pande et Srivastava are both identical to this species. Chen (1955) described a new variety of this species, var. *purpurea*, which, however, seems to be a modification caused by environmental conditions.

f. **stolonifera** Hattori, f. nov. A typo recedit caulibus stoloniferis.

Baroya Khimty-Thakma Khola, 2500-3000 m (Nov. 14, 1963; no. 236761--type in NICH, TI).

Distr. f. Endemic.

This new forma may possibly be an environmental modification just like var. *purpurea* Chen, but the flagellate shoots are very remarkable.

PLAGIOCHILACEAE

Plagiochila alata Inoue in Bull. Sci. Mus. Tokyo **8** (3): 383, f. 3 (1965).

Migothang-Nayathang, 3300-3900 m (Jun. 1, 1960; no. 201141—paratype); Phalut, 3550 m (Jun. 5, 1960; no. 200975—holotype; no. 200974—paratype).

Distr. Endemic.

Plagiochila asymmetrica Steph., Sp. Hepat. **6**: 125 (1917).

Phalut, 3550 m (May 10, 1960; nos. 201491, 201503); Baroya Khimty-Thakma Khola, 2500-3000 m (Nov. 16, 1963; no. 237785); Thakma Khola-Yamphodin, 2100-3300 m (Nov. 17, 1963; no. 237751).

Distr. Nepal. Sikkim, and Bengal.

Plagiochila Beddomei Steph., Sp. Hepat. **2**: 361 (1903).

Pamianchi, 2000 m (May 13, 1960; no. 226978).

Distr. Sikkim, Nilghiris, and S. India. New to Himalaya.

Plagiochila biloba Inoue, sp. nov.

Planta similis *Plagiochilae retusae*, sed folia caulina 1/3–1/2 biloba, lobis acuminatis.

Walunchung Gola–Zongi, 2700–2800 m (Nov. 11, 1963; no. 236452—type in herb. NICH ; dupl. in TI).

Distr. Endemic.

Plagiochila capillaris Schiffn. ex Steph., Sp. Hepat. **6**: 137 (1918).

Phalut–Dentam, 1450–3630 m (May 11, 1960; no. 201258).

Distr. Sikkim, and China (Yunnan).

Plagiochila Cardotii Steph. in Bull. Soc. Roy. Belgique **41** (2): 121 (1904).

Sandakphu–Tonglu, 2600–3550 m (Jun. 7, 1960); Tonglu, Darjeeling, 2150–3000 m (Jun. 8, 1960); Darjeeling–Senchal, 2150–2400 m (Jun. 23, 1960); Helok–Baroya Khimty, 1500–2500 m (Nov. 15, 1963); Baroya Khimty–Thakma Khola, 2500–3000 m (Nov. 16, 1963); near Chyangthaphu–Birwa, 1100–2100 m (Nov. 27, 1963).

Distr. E. Nepal, and Sikkim.

Plagiochila Carringtonii (Balfour) Grolle in Trans. Brit. Bryol. Soc. **4** (4): 656 (1964)–*Adelanthus Carringtonii* Carr. in Balfour in Journ. Proc. Bot. Soc. Edinburg. **10**: 378 (1870).

subsp. **lobuchensis** Grolle, l.c. 660 (1964).

Jongri, 4000–4200 m (May 20, 1960; no. 201574).

Distr. subsp. Nepal, and Sikkim.

Subsp. *Carringtonii* has previously been known as *Jamesoniella Carringtonii* in sterile state, restricted in Scotland and Faeroes. Grolle (1964) found the perianth and transferred it to the genus *Plagiochila*. Nicholson (1930) described *Jamesoniella Carringtonii* var. *recurvata* Nichols. from N. W. Yunnan, China. Grolle (1964) studied the type of this variety and found it to be a species of *Plagiochila, P. recurvata* (Nichols.) Grolle. All these knowledges show that Himalayas–S. W. China highlands include many phytogeographically important taxa and may be considered a center of Eurasian bryoflora before the Ice age.

Plagiochila chinensis Steph. in Mem. Soc. Sci. Nat. Math. Cherbourg **29**: 223 (1894).

Zongi–Iladanda. 1800–2700 m (Nov. 12, 1963 ; no. 236570).

Distr. E. Nepal, China (Yunnan), and Formosa. New to Himalaya.

Plagiochila crassitexta Steph., Sp. Hepat. **2**: 359 (1903).

Yoksam, 1700 m (May 17, 1960 ; nos. 201553, 201554) ; Penlong La, near Gangtok, 2100 m (Jun. 16, 1960 ; no. 237913).

Distr. Sikkim, Assam, Philippines (Luzon), China, and Japan. New to Himalaya. This species belongs to sect. Peculiares, with its peculiar cell-structure, and previously has been known disjunctively in Khasia Hills, Luzon, China and Japan. In Japan it rarely occurs in montane areas of Kyushu (including Yakushima I.) and Shikoku. *Plagiochila Nakaiana* Hatt. described from southern Kyushu is synonymous to this species.

Plagiochila debilis Mitt. in Journ. Linn. Soc. **5**: 97 (1861).

Senchal–Tiger Hill, 2250–2500 m (Apr. 16, 1960); Phalut, 3550 m (May 10, 1960); Phalut–Dentam, 1450–3630 m (May 11, 1960); Sandakphu–Tonglu, 2600–3550 m (Jun. 7, 1960); Darjeeling–Senchal, 2150–2500 m (Jun. 23, 1960); Helok–Baroya

Khimty, 1500–2500 m (Nov. 10, 1963); Baroya Khimty–Thakma Khola, 2500–3000 m (Nov. 16, 1963).

Distr. E. Himalaya, and Bengal.

Plagiochila denticulata Mitt. in Journ. Linn. Soc. **5**: 95 (1861).

Ghum–Senchal, 2250 m (Apr. 4, 1960; no. 201073); Tingling Bridge–Yoksam, 1000–1700 m (May 16, 1960; no. 200085); Sandakphu–Tonglu, 2600–3550 m (Jun. 7, 1960; no. 200984);

Distr. Sikkim, and Bengal.

Plagiochila Determii Steph., Sp. Hepat. **2**: 361 (1903).

Darjeeling, 2000–2200 m (Apr. 2, 1960); Victoria Falls, Darjeeling, 1950 m (Apr. 3, 1960); Senchal–Tiger Hill, 2250–2500 m (Apr. 16, 1960); Senchal, 2400 m (Apr. 16, 1960); Peshok–Lopchu, 1000–1500 m (Apr. 28, 1960); Chia Bhanjang–Dentam, 1400–3100 m (May 11, 1960); below Bakkim–Jongri, 2200–4000 m (May 19, 1960); Gangtok, 1900 m (Jun. 17, 1960); Darjeeling–Senchal, 2150–2500 m (Jun. 23, 1960); Bilbatay Bhanjang–Hati Sar, 2200–3000 m (Oct. 27, 1963); Zongi–Iladanda, 1800–2700 m (Nov. 12, 1963); Baroya Khimty–Thakma Khola, 2500–3000 m (Nov. 16, 1963); Birwa–Yektin, 1200–2500 m (Nov. 28, 1963); Bhuspate Danra, 2600 m (Dec. 2, 1963); Mai Majuwa–Dhara Pani, 1500–1900 m (Dec. 4, 1963).

Distr. E. Himalaya, and W. China (Yunnan).

Plagiochila Durelii Schiffn. in Oesterr. Bot. Zeitschr. **49**: 131 (1899).

Baroya Khimty–Thakma Khola, 2500–3000 m (Nov. 12 & 16, 1963); Helok–Baroya Khimty, 1500–2500 m (Nov. 15, 1963); Thakma Khola–Yamphodin, 2100–3300 m (Nov. 17, 1963); Ghatte–Khebang, 1600–2200 m (Nov. 19, 1963).

Distr. E. Himalaya (E. Nepal, and Bhutan).

Plagiochila elegans Mitt. in Journ. Linn. Soc. **5**: 97 (1861).

Batasi–Palmajua, 2300–2600 m (May 3, 1960); Sandakphu–Tonglu, 2600–3550 m (Jun. 7, 1960); Lower Road, Rabong La–Temi, 1000–1300 m (Mar. 28, 1963); Yamphodin–Ghatte, 1600–2100 m (Nov. 18, 1963).

Distr. E. Nepal, Sikkim, Bengal, China, and Formosa.

Plagiochila ferruginea Steph., Sp. Hepat. **2**: 364 (1903).

Pamianchi–Gayzing Bazar, 1550–2000 m (May 13, 1960; no. 201075); Jongri, 4000 m (May 20, 1960; no. 201169).

Distr. Himalaya (Mussoorie, Nepal, Sikkim), and Bengal.

Plagiochila firma Mitt. in Journ. Linn. Soc. **5**: 95 (1861).

Tenzing Norkay Road–Birch Hill, 2000 m (Apr. 5, 1960); Senchal–Tiger Hill, 2400–2500 m (Apr. 16, 1960); Phalut, 3550 m (May 12 & Jun. 5, 1960); below Bakkim–Jongri, 2200–4000 m (May 19, 1960); Phalut–Sandakphu, 3200–3500 m (Jun. 6, 1960); Sandakphu–Tonglu, 2600–3500 m (Jun. 7, 1960); Happy Valley, Darjeeling (Jun. 25, 1960); Hati Sar–Minchin Dhap, 2600–3000 m (Oct. 28, 1963); Baroya Khimty–Thakma Khola, 2500–3000 m (Nov. 16, 1963); Siling Tzokupa, 2000–3000 m (Nov. 21, 1963); Birwa–Yektin, 1200–2500 m (Nov. 28, 1963).

var. **acicularis** (Herz.) Inoue in Journ. Hattori Bot. Lab. **23**: 34 (1960)–*Plagiochila acicularis* Herz. in Mem. Soc. Faun. Fl. Fenn. **26**: 40 (1950).

Senchal–Tiger Hill, 2400–2500 m (Apr. 16, 1960); Migothang, 3900 m (May 29, 1960); Phalut, 3550 m (Jun. 5, 1960); Sandakphu–Tonglu, 2600–3550 m (Jun. 7, 1960); Penlong La, near Gangtok, 2100 m (Jun. 16, 1960); Darjeeling–Tiger Hill, 2150–2500 m (Jun. 23, 1960); Taplejung, 1700 m (Nov. 2, 1963); Helok–Baroya Khimty, 1500–2500 m (Nov. 10, 1963); Baroya Khimty–Thakma Khola, 2500–3000 m (Nov. 16, 1963).

Distr. sp. Widely distributed from Asia to the Pacific coast of Alaska and Canada, representing as the following regional taxa: subsp. *firma* is in Eastern Himalaya, with its var. *acicularis* which also occurs in Formosa disjunctively; subsp. *rhizophora* (Hatt.) Inoue (=*Plagiochila rhizophora* Hatt.) is in Japan and Korea; and subsp. *confusa* (Schust.) Inoue (=*Plagiochila rhizophora* subsp. *confusa* Schust.) is in Aleutian Is. and British Columbia.

Plagiochila flexuosa Mitt. in Journ. Linn. Soc. **5**: 94 (1861).

Ghum–Senchal, 2250 m (Apr. 4, 1960); Senchal, 2200–2400 m (Apr. 6, 1960); Senchal–Tiger Hill, 2200–2500 m (Apr. 16, 1960); Takdah, 1600–1700 m (Apr. 18, 1960); Yoksam–below Bakkim, 2400–2500 m (May 18, 1960); Selap–Walunchung Gola, 2600–3200 m (Nov. 10, 1963).

Distr. Sikkim, Bengal, and Japan.

This species disjunctively occurs also in Japan where it was known previously as *Plagiochila titibuensis* Hattori (described as a new from Chichibu Mts.) from several mountains in the southwestern flank of Japan.

Plagiochila fruticosa Mitt. in Journ. Linn. Soc. **5**: 94 (1861).

Kurseong, 1550 m (Apr. 12, 1960); Senchal–Tiger Hill, 2200–2500 m (Apr. 16, 1960); Takdah, 1600–1700 m (Apr. 18, 1960); Peshok–Lopchu, 900–1800 m (Apr. 28, 1960); Lopchu, 1500 m (Apr. 28, 1960); Batasi, 2000 & 2150 m (May 2 & 4, 1960); Rimbick, 2200 m (May 6, 1960); Pamianchi–Gayzing Bazar, 1550–2000 m (May 13, 1960); Tingling Bridge–Yoksam, 1000–1700 m (May 16, 1960); Yoksam, 1700 m (May 17, 1960); below Bakkim–Jongri, 2200–4000 m (May 19, 1960); Penlong La, near Gangtok, 2100 m (Mar. 18, 1963); Tendong Peak, 2700 m (Mar. 26, 1963); Lower Road, Rabong La–Temi, 1000–1300 m (Mar. 28, 1963).

Distr. Himalaya, Khasia, Bengal, Formosa, and Japan (from middle Honshu, Pacific side, to Amami-Oshima I.).

This species is rather common also in Japan, occurring in lower montane areas of southeastern flank of Japan, extending northwards to Kanto district.

Plagiochila Gammiana Steph., Sp. Hepat. **2**: 378 (1903).

Gangtok, 1900 m (Jun. 13, 1960; no. 201755); Do., 1750 m (no. 201139).

Distr. Sikkim, and Bengal.

Plagiochila Gollanii Steph., Sp. Hepat. **2**: 368 (1903).

Tenzing Norkay Road–Birch Hill, 2000 m (Apr. 5, 1960); Senchal–Tiger Hill, 2400–2500 m (Apr. 16, 1960); Batasi, 2000 m (May 2, 1960); Palmajua–Rimbick, 1400–2300 m (May 5, 1960); Yoksam, 1700 m (May 17, 1960); Gangtok, 1900 m (Jun. 17, 1960); Bilbatay Bhanjang, 2200 m (Oct. 26, 1963); Minchin Dhap–Mul Pokhari, 2400–2800 m (Oct. 29, 1963); Iladanda–Selap, 1800–2600 m (Nov. 9, 1963); Baroya Khimty–Thakma Khola, 2500–3000 m (Nov. 16, 1963); Yamphodin–Ghatte, 1600–2100 m (Nov. 18, 1963).

Distr. Himalaya, Mussoorie, Punjab, Bengal, Formosa, and Japan.

This species has been found occasionally in the montane areas of southwestern flank of Japan where it was firstly known in Shikoku as *Plagiochila Makinoana* Hatt., a later synonym of the present species.

Plagiochila grata Steph., Sp. Hepat. **6**: 160 (1918).

Takdah, 1600–1700 m (Apr. 18, 1960; no. 201405).

Distr. Simla, and Sikkim.

Plagiochila Griffithiana Steph., Sp. Hepat. **6**: 160 (1918).

Tingling Bridge–Yoksam, 1000–1700 m (May 16, 1960; no. 200085).

Distr. Sikkim, and Assam. New to Sikkim.

Plagiochila Grollei Inoue in Bull. Sci. Mus. Tokyo **8** (3): 384, f. 4 (1965).

Baroya Khimty–Thakma Khola, 2500–3000 m (Nov. 16, 1963; nos. 236770, 236780).

Distr. Endemic.

Plagiochila hamulispina Herz. in Hand.-Mzt., Symb. Sin. **5**: 19 (1930).

Thakma Khola–Yamphodin, 2100–3300 m (Nov. 17, 1963; no. 237764).

Distr. Nepal, Burma, and China. New to Himalaya.

Plagiochila Harae Inoue, sp. nov.

Planta *Plagiochilae torquescenti* simillima, sed folia caulina late ovata, carina perianthiorum nuda, haud lobata.

Thakma Khola–Yamphodin, 2100–3300m (Nov. 17, 1963; no. 237757—type in herb. NICH; dupl. in TI).

Distr. Endemic.

Plagiochila khasiana Mitt. in Journ. Linn. Soc. **5**: 95 (1861).

Minchin Dhap–Mul Pokhari, 2400–2800 m (Oct. 29, 1963; no. 237896).

Distr. Nepal, Khasia, and Ceylon. New to Himalaya.

Plagiochila microphylla Steph., Sp. Hepat. **2**: 330 (1903).

Phalut, 3550 m (May 10, & Jun. 5, 1960); Migothang, 3900 m (May 29, 1960); Hati Sar–Minchin Dhap, 2600–3000 m (Oct. 28, 1963); Siling Tzokupa, 2000–3000 m (Nov. 21, 1963).

Distr. Nepal, Sikkim, and Bhutan.

Plagiochila Mittenii Steph. in Bull. Herb. Boiss. **5**: 83 (1897).

Pamianchi–Gayzing Bazar, 1550–2000 m (May 13, 1960; no. 201075).

Distr. Himalaya.

Plagiochila mundaliensis Steph., Sp. Hepat. **2**: 340 (1903).

Senchal–Tiger Hill, 2400–2500 m (Apr. 16, 1960); Walunchung Gola–Zongi, 2700–3800 m (Nov. 11, 1963).

Distr. Himalaya (Mundali, E. Nepal, and Sikkim).

Plagiochila nana Steph., Sp. Hepat. **6**: 188 (1921).

Phalut, 3550 m (Jun. 5, 1960); Senchal–Tiger Hill, 2400–2500 m (Jun. 23, 1960).

Distr. Simla, and Sikkim. New to Himalaya.

Plagiochila neorupicola Inoue in Bryologist **68**: 218 (1965)–*P. rupicola* Steph. (1921), non Steph. (1895).

Tenzing Norkay Road–Birch Hill, 2000m (Apr. 5, 1960; no. 201062—type); Penlong La, Gangtok, 2100 m (Mar. 18, 1963; no. 237903).

Distr. Endemic.

Plagiochila nepalensis Lindenb. in Lindenb. et Gott., Monogr. Plagiochilae 93 (1842).

Senchal–Tiger Hill, 2400–2500 m (Apr. 16, 1960); Rimbick, 2200 m (May 6, 1960); Phalut, 3550 m (May 10, 1960); Minchin Dhap–Mul Pokhari, 2400–2800 m (Oct. 29, 1963); Mul Pokhari–Dumhan, 700–2400 m (Oct. 30, 1963); Taplejung–Garhi Danra, 1700–2000 m (Nov. 3, 1963); Garhi Danra–Tuwa, 1400–2000 m (Nov. 4, 1963);

N. Nepal (sine loco speciali).

Distr. E. Himalaya to S. India, Burma, Malay, Java, Celebes, and W. China (Yunnan).

Plagiochila orientalis Tayl. in Lond. Journ. Bot. **5**: 261 (1846).

Baroya Khimty–Thakma Khola, 2500–3000 m (Nov. 16, 1963; nos. 236810, 236854).

Distr. Nepal, Sikkim, and Assam.

Plagiochila palmiformis Steph. in Bull. Soc. Bot. Belgique **41** (2): 121 (1904).

Penlong La, near Gangtok, 2100 m (Mar. 18, 1963; nos. 237913, 237929).

Distr. Sikkim, and Bengal.

Plagiochila perserrata Herz. in Hand.-Mzt., Symb. Sin. **5**: 19 (1930).

Baroya Khimty–Thakma Khola, 2500–3000 m (Nov. 16, 1963).

Distr. E. Himalaya, and W. China (Yunnan). New to Himalaya.

Plagiochila phalangea Tayl. in Lond. Journ. Bot. **5**: 264 (1846).

Lopchu, 1500 m (Apr. 28, 1960); Gangtok, 1900 m (Jun. 17, 1960); Mul Pokhari–Dumhan, 700–2400 m (Oct. 30, 1963); Taplejung–Garhi Danra, 1700–2000 m (Nov. 3, 1963); Iladanda–Selap, 1800–2100 m (Nov. 9, 1963).

Distr. Nepal, and Sikkim.

Plagiochila pseudofirma Herz. in Hand.-Mzt., Symb. Sin. **5**: 17 (1930).

Below Bakkim–Jongri, 2200–4000 m (May 19, 1960); Jongri, 4000 m (May 19, 1960); Helok–Baroya Khimty (Nov. 15, 1963).

Distr. E. Himalaya and W. China (Szechuan). New to Himalaya.

Plagiochila pseudomicrophylla Inoue, sp. nov.

Planta *Plagiochilae microphyllae* similis, sed caulis haud radiculosus, folia fere cum 2 dentibus multo majoribus, cellulae medianae foliorum 24–35 × 23–29 μ metientes.

Hati Sar–Minchin Dhap, 2600–3000 m (Oct. 28, 1963; no. 236069—type in herb. NICH; dupl. in TI); Siling Tzokupa, 2000–3000 m (Nov. 21, 1963).

Distr. Endemic.

Plagiochila pseudopoeltii Inoue in Bull. Sci. Mus. Tokyo **8** (3): 382, f. 2 (1965).

Migothang–Nayathang, 3300–3900 m (Jun. 1, 1960; no. 201281—paratype); Phalut, 3550 m (Jun. 5, 1960; no. 201010—holotype; no. 201011).

Distr. Endemic.

Plagiochila pseudorenitens Schiffn. in Oesterr. Bot. Zeitschr. **49**: 132 (1889).

Darjeeling, 2000–2200 m (Apr. 7, 1960); Rimbick–Ramam, 1900–2400 m (May 7, 1960); Phalut, 3550 m (May 10 & 12, Jun. 5, 1960); Jongri, 4000 m (May 21, 1960); Jongri–Gamothang, 3600–4200 m (May 26, 1960); Migothang–Nayathang, 3300–3900 m (Jun. 1, 1960); Darjeeling–Senchal, 2150–2500 m (Jun. 23, 1960); Happy Valley, Darjeeling, (Jun. 26, 1960); Iladanda–Helok, 1500–1900 m (Nov. 13, 1963).

Distr. E. Himalaya, and Bengal.

Plagiochila retusa Mitt. in Journ. Linn. Soc. **5**: 96 (1861).

Phalut, 3550 m (May 10, 1960); Jongri, 4000–4200 m (May 21, 1960); Jongri–Olothang, 2600–4000 m (May 23, 1960).

Distr. Sikkim, and Bengal.

Plagiochila sciophila Nees in Lindenb. et Gott., Mongr. Plagiochilae 100 (1842).

Takdah, 1600–1700 m (Apr. 8, 1960); Senchal, 2400 m (Apr. 16, 1960); Senchal-Tiger Hill, 2400–2500 m (Apr. 16, 1960); Peshok-Lopchu, 900–1500 m (Apr. 28, 1960); Yoksam-below Bakkim, 1700–2200 m (May 18, 1960); Sandakphu-Tonglu, 2600–3550 m (Jun. 7, 1960); Penlong La, near Gangtok, 2100 m (Mar. 27, 1963); Iladanda-Selap, 1800–2600 m (Nov. 9, 1963).

Distr. Nepal, Sikkim, Khasia, Tonkin, and China.

Plagiochila secretifolia Mitt. in Journ. Linn. Soc. **5**: 98 (1861).

Tenzing Norkay Road–Birch Hill, 2000 m (Apr. 5, 1960); Senchal-Tiger Hill, 2400–2500 m (Apr. 16, 1960); Garibans–Tonglu, 2800–3000 m (Jun. 7, 1960); Darjeeling-Senchal, 2150–2500 m (Jun. 23, 1960); Happy Valley, Darjeeling, (Jun. 25, 1960); Hati Sar–Minchin Dhap, 2600–3000 m (Oct. 28, 1963); Yamphodin–Ghatte, 1600–2100 m (Nov. 18, 1963).

Distr. E. Himalaya, and Bengal.

Plagiochila semidecurrens (Lehm. et Lindenb.) Lehm. et Lindenb. in Gott., Lindenb. & Nees, Syn. Hepat. 59 (1844).

Darjeeling, 2000–2100 m; Happy Valley, Darjeeling, 2000 m; Darjeeling–Senchal, 2150–2500 m; Senchal, 2400 m; Senchal–Tiger Hill, 2400–2500 m; Penlong La, near Gangtok, 2100 m; Sandakphu–Tonglu, 2600–3550 m; Phalut, 3550 m; Phalut–Dentam, 1450–3550 m; Phalut–Sandakphu, 3200–3550 m; Phalut–Chia Bhanjang, 3100–3550 m; Chia Bhanjang–Dentam, 1450–3100 m; Jongri, 4000–4200 m; Jongri–Olothang, 3600–4000 m; Migothang-Nayathang, 3300–3900 m; Hati Sar–Minchin Dhap, 2600–3000 m; Taplejung, 1700 m; Iladanda–Selap, 1800–2600 m; Selap–Walunchung Gola, 2600–3200 m; Helok–Baroya Khimty, 1500–2500 m; Baroya Khimty–Thakma Khola, 2500–3000 m; Thakma Khola–Yamphodin, 2100–3300m; Yamphodin–Ghatte, 1600–2100 m; Siling Tzukupa 2000–3000 m; near Chyangthaphu–Birwa, 1100–1200 m; Bhuspate Danra, 2600 m; Bhuspate Danra–Mai Majuwa, 1600–2900 m.

var. **undulata** Carl in Ann. Bryol. suppl. **2**: 98 (1931)–*Plagiochila semidecurrens* f. *undulata* (Carl) Inoue in Journ. Hattori Bot. Lab. **20**: 81 (1958).

Jongri–Gamothang, 3600–4200 m (May 26, 1960; no. 201192).

var. **longifolia** Inoue, var. nov.

A typo recedit foliis plus duplo longioribus quam latis.

Yamphodin–Ghatte, 1600–2100 (Nov. 18, 1963; no. 236966—type in herb. NICH; dupl. in TI).

Distr. sp. E. Himalaya, Khasia, Bengal, Ceylon, China, Formosa, Japan, Philippines, and Alaska (subsp. *alaskana*).

This is a very polymorphous species, widely distributed in warm-temperate to subtropical regions of southeastern Asia. In this area it was found in more than 100 collections, most of which were made at elevations of 2000–3000 m, and is the most frequent species of Himalayan *Plagiochila*. Among many variations found in this species the most important will be a geographical race which is distributed in the Pacific coast of Alaska and on high mountains of central Japan. In Japan var. *undulata* and subsp. *alaskana*(1) are both rare and occur on high mountains in central

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(1) *Plagiochila semidecurrens* subsp. **alaskana** (Evans) Hatt., comb. nov.—*Plagiochila alaskana* Evans in Bull. Torrey Bot. Cl. **41**: 590 (1914)—*P. semidecurrens* subsp. *grossidens* f. *alaskana* (Evans) Schust. in Amer. Midl. Naturalist **62**: 273 (1959)—*P. Fryei* Evans in Bull. Torrey Bot. Cl. **41**: 593 (1914)—*P. semidecurrens* var. *Shimizuana* Inoue in Journ. Hattori Bot. Lab. **20**: 81 (1958)—*P. semidecurrens* subsp. *grossidens* var. *Shimizuana* Inoue in Journ. Hattori Bot. Lab. **25**: 197 (1962).

Honshu restrictedly. Whereas subsp. *grossidens* (Herz.) Schust. is not uncommon in Kyushu, Shikoku, and southern to central Honshu, occurring on not so high mountains there, for instance at an elevation of 700 m in southernmost part of Kyushu.

Plagiochila seminuda Inoue, sp. nov.

Planta *Plagiochilae Duthianae* similis, sed margo foliorum 1–5-dentatus, cellulae foliorum cum trigonis plus minusve nodulosis.

Helok–Baroya Khimty, 1500–2500 m (Nov. 15, 1963; no. 236627—type in herb. NICH; dupl. in TI).

Distr. Endemic.

Plagiochila sikutzisana Mass. in Mem. Accad. Agr. Art. Verona **73** (3): 13 (1897).

Helok–Baroya Khimty, 1500–2500 m (Nov. 15, 1963; no. 236633).

Distr. E. Nepal, and China (Shensi). New to Himalaya.

Plagiochila subpropinqua Schiffn. ex Steph., Sp. Hepat. **6**: 211 (1921).

Pamianchi–Gayzing Bazar, 1550–2000 m (May 13, 1960); Gangtok, 1750 m (Jun. 14, 1960).

Distr. Sikkim, and Bengal.

Plagiochila subsymmetrica Steph., Sp. Hepat. **6**: 212 (1921).

Hati Sar–Minchin Dhap, 2600–3000 m (Oct. 28, 1963; no. 237714); Baroya Khimty–Thakma Khola, 2500–3000 m (Nov. 16, 1963; no. 237796).

Distr. E. Nepal, and Darjeeling.

Plagiochila Thomsonii Steph., Sp. Hepat. **2**: 372 (1903).

Darjeeling–Senchal, 2150–2500 m (Jun. 23, 1960; no. 201110).

Distr. Sikkim, and Bengal.

Plagiochila Togashii Inoue, sp. nov.

Planta *Plagiochilae firmae* simillima, sed carina dorsalis perianthiorum alata.

Senchal, 2400 m (Apr. 16, 1960; no. 201352); Penlong La, Gangtok, 2100 m (Jun. 16, 1960); Walunchung Gola–Zongi, 2700–3800 m (Nov. 11, 1963); Thakma Khola–Yamphodin, 2100–3300 m (Nov. 17, 1963; no, 237769—type in herb. NICH; dupl. in TI); Siling Tzokupa, 2000–3000 m (Nov. 21, 1963).

Distr. Endemic.

Plagiochila torquescens Herz. in Hand.-Mzt., Symb. Sin. **5**: 21 (1930).

Sandakphu–Tonglu, 2800–3550 m (Jun. 7, 1960; nos. 201000, 201121).

Distr. Sikkim, and China (Yunnan).

Plagiochila zonata Steph. in Mem. Soc. Nat. Sci. Math. Cherbourg **29**: 225 (1894).

Jongri–Olothang, 3600–4000 m (May 23, 1960); Iladanda–Helok, 1500–1900 m (Nov. 13, 1963); Thakma Khola–Yamphodin, 2100–3300 m (Nov. 17, 1963).

Distr. E. Nepal. Sikkim, and W. China (Yunnan, Szechuan).

Plagiochila zongiensis Inoue, sp. nov.

Habitu *P. Wilsonianae* similis, sed differt marginibus foliorum posticorum longe decurrentibus, ampliatis.

Zongi–Iladanda, 1800–2700 m (Nov. 12, 1963; no. 236545—type in NICH; dupl. in TI; no. 236544).

Distr. Endemic.

Plagiochilion Mayebarae Hatt. in Journ. Hattori Bot. Lab. **3**: 39 (1950).

Senchal, 2400 m (Apr. 16, 1960); Phalut, 3550 m (May 10 & Jun. 5, 1960); Jongri, 4000–4200 m (May 20–22, 1960); Migothang–Nayathang, 3300–3900 m (Jun. 1, 1960); Phalut–Sandakphu, 3200–3550 m (Jun. 6, 1960); Sandakphu–Tonglu, 2800–3550 m (Jun. 7, 1960); Darjeeling–Senchal, 2150–2500 m (Jun. 23, 1960); Darjeeling–Tiger Hill, 2150–2500 m (Jun. 23, 1960); Happy Valley, Darjeeling (Jun. 26, 1960); Hati Sar–Minchin Dhap, 2600–3000 m (Oct. 28, 1963); Minchin Dhap–Mul Pokhari, 2400–2800 m (Oct. 29, 1963).

Distr. E. Nepal, Sikkim, China, Formosa, and Japan.

One of the common species in this area.

SCAPANIACEAE

Scapania angusta Mitt. ex K. Muell. in Nova Act. Acad. Caes. Leop.-Carol. **83**: 208 (1905).

Sandakphu–Tonglu, 2800–3550 m (Jun. 7, 1960; no. 201007).

Distr. Sikkim, and Bhutan.

Scapania contorta Mitt. in Journ. Linn. Soc. **5**: 101 (1861)-*Diplophyllum contortum* (Mitt.) Steph. (1910)-*Scapania papillosa* K. Muell. (1936).

Baroya Khimty–Thakma Khola, 2500–3000 m (Nov. 16, 1963; nos. 236742, 236774).

Distr. E. Himalaya.

Scapania ferruginea (Lehm. et Lindenb.) Lehm. et Lindenb. in Gott., Lindenb. & Nees, Syn. Hepat. 72 (1844).

Ghum–Senchal, 2250–2800 m (Apr. 4 & Jun. 7, 1960); Phalut–Dentam, 1450–3630 m (May 11, 1960); below Bakkim–Jongri, 2200–4000 m (May 19, 1960); below Jongri, 3600 m (May 19, 1960); Jongri, 4000–4200 m (May 20 & 21, 1960); Jongri–Olothang, 3600–4000 m (May 23, 1960); Migothang–Nayathang, 3300–3900 m (Jun. 1, 1960); Nayathang–Chia Bhanjang, 3100–3300 m (Jun. 2, 1960); Phalut, 3550 m (Jun. 5, 1960); Phalut–Sandakphu, 3200–3550 m (Jun. 6, 1960); Sandakphu–Garibans, 2800–3550 m (Jun. 7, 1960); Sandakphu–Tonglu, 2800–3550 m (Jun. 7, 1960); Penlong La, near Gangtok, 2100 m (Mar. 18, 1963); Taplejung, 1700 m (Nov. 2, 1963); Selap–Walunchung Gola, 2600–3200 m (Nov. 10, 1963); Baroya Khimty–Thakma Khola, 2500–3000 m (Nov. 12 & 16, 1963); Thakma Khola–Yamphodin, 2100–3300 m (Nov. 17, 1963); Siling Tzokupa, 2000–3000 m (Nov. 21, 1963); near Chyangthaphu–Birwa, 1100–2100 m (Nov. 27, 1963).

Distr. sp. Himalaya, Java, and Formosa.

var. **minor** Amakawa in Journ. Hattori Bot. Lab. **27**: 9 (1964).

Phalut, 3550 m (May 10 & 11, Jun. 5, 1960); Jongri, 4000–4200 m (May 20 & 22, 1960); Phalut–Sandakphu, 3200–3550 m (Jun. 6, 1960); Sandakphu–Tonglu, 2800–3550 m (Jun. 7, 1960); Hati Sar–Minchin Dhap, 2600–3000 m (Oct. 28, 1963); Helok–Baroya Khimty, 1500–2500 m (Nov. 15, 1963); Thakma Khola–Yamphodin, 2100–3300 m (Nov. 17, 1963); Siling Tzokupa, 2000–3000 m (Nov. 21, 1963).

Distr. var. E. Himalaya (Nepal, Sikkim).

This is one of the commonest species in this area.

Scapania Griffithii Schiffn. in Oesterr. Bot. Zeitschr. **4**: 7 (1899).

Birch Hill, Darjeeling, 2000 m (Apr. 7, 1960).

Distr. Sikkim, Bengal, and China (Yunnan, Hunan).

Herzog (1932) recorded from the Philippines *Scapania Griffithii* Schiffn. var. *spathulata* (Steph.) Muell. (1905), but I am not quite sure on the identity of the Philippine material.

Scapania Harae Amakawa in Journ. Hattori Bot. Lab. **27**: 5 (1964).

Jongri, 4000–4200 m (May 20 & 22, 1960); Jongri–Olothang, 3600–4000 m (May 23, 1960; no. 201176—holotype).

Distr. Sikkim.

Ten collections were made at Jongri and between Jongri and Olothang. This endemic species is quite unique for its large, comfit-shaped papillae over the cell-lumina of leaves, and may be one of the representatives of this area.

Scapania Levieri K. Muell. in Nova Act. Acad. Caes. Leop.-Carol. **83**: 140 (1905).

Below Bakkim–Jongri, 2200–4000 m (May 19, 1960); Hati Sar–Minchin Dhap, 2600–3000 m (Oct. 28, 1963).

Distr. E. Himalaya, Bengal, and China (Yunnan, Hunan).

This species is very closely related to, and may be conspecific with Japanese *Scapania ciliata* Sde. Lacoste (*S. spinosa* Steph.). The differences between these two taxa are considered to be caused by environmental conditions. This species is somewhat smaller than *S. ciliata*; the leaves are also not so large and not so wide, the leaf-carina is relatively long, and the papillae over the cell-lumina and the marginal teeth of leaves are not so well-developed, as compared to *S. ciliata.*

Scapania ligulata Steph. in Hedwigia **44**: 14 (1904).

Below Bakkim–Jongri, 2200–4000 m (May 19, 1960); Sandakphu–Tonglu, 2800–3500 m (Jun. 7, 1960); Hati Sar–Minchin Dhap, 2600–3000 m (Oct. 28, 1963).

Distr. E. Nepal, Sikkim, and Japan (excluding Hokkaido).

Scapania nimbosa Tayl. in Lehm., Pugillus **8**: 6 (1844).

Phalut, 3550 m (May 10, 1960; nos. 201520–201522).

Distr. Scotland, Norway, Sikkim, and China (Yunnan).

Before Nicholson (1930) recorded a variety[1] of this species in Yunnan, and Amakawa (1964) reported the species from this area, *Scapania nimbosa* had been known only from southwestern Norway and northwestern Scotland, very limitedly.

Scapania Okamurana Steph. in Amak. et Hatt. in Journ. Hattori Bot. Lab. **12**: 106 (1954).

Sandakphu–Tonglu, 2800–3550 m (Jun. 7, 1960; nos. 232508, 232510, 232511).

Distr. Sikkim, and Japan (Honshu).

Scapania orientalis Steph. ex K. Muell. in Nova Act. Acad. Caes. Leop-Carol. **83**: 298 (1905).

Phalut, 3550 m (Jun. 5, 1960; no. 201726).

Distr. Himalaya, and W. China (Yunnan, Szechuan).

Scapania ornithopodioides (With.) Pears., Hepat. Brit. Isl. 219 (1900).

Phalut, 3550 m (May 10, 1960); Jongri, 4000–4200 m (May 20 & 22, 1960); Jongri–Olothang, 3600–4000 m (May 23, 1960), Sandakphu–Tonglu, 2800–3550 m (Jun. 7, 1960); Hati Sar–Minchin Dhap, 2600–3000 (Oct. 28, 1963); Selap–Walunchung Gola, 2600–

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[1] Nicholson (1930) described *Scapania nimbosa* Tayl. var. *yunnanensis* Nichols. from Yunnan, but it seems better considered to be the same taxon as var. *nimbosa*.

3200 m (Nov. 10, 1963); Helok–Baroya Khimty, 1500–2500 m (Nov. 15, 1963); Baroya Khimty–Thakma Khola, 2500–3000 m (Nov. 16, 1963); Thakma Khola–Yamphodin, 2100–3300 (Nov. 17, 1963); Yamphodin–Ghatte, 1600–2500 m (Nov. 18, 1963); near Chyangthaphu–Birwa, 1100–2100 m (Nov. 27, 1963); E. Nepal, sine loco speciali.

Distr. N. W. Europe, Himalaya, China (Yunnan), Philippines, Formosa, Japan (excl. Hokkaido), and Alaska (North Pacific coast of America).

Scapania pseudoferruginea Amak. in Journ. Hattori Bot. Lab. **27**: 9 (1964).

Senchal–Tiger Hill, 2400–2500 m (Apr. 16, 1960; no, 232506—holotype); Rimbick, 2200 m (May 6, 1960; no. 201067); Thakma Khola–Yamphodin, 2100–3300 m (Nov. 17, 1963; no. 237770).

Distr. E. Nepal, and Darjeeling.

MARSUPELLACEAE

Marsupella nitida N. Kitagawa, sp. nov.

Planta mediocris, rufobrunnea vel nigricans, nitida, muscis consociata; caulis ascendens, ad 2 cm longus, cum foliis 0.8–1.5 mm latus, radiculis parvis; folia inferiora remotiuscula, superiora conferta, subrecte patula, concava, in plano subrotunda, 0.6–1.2 mm longa, 0.5–1.1 mm lata, 1/7–1/5 inaequaliter bifida, lobis late triangularibus, subacutis, lobo postico longiore et latiore, sinu lunato; cellulae foliorum minimae, marginales 6–10 μ, mediae 10–14 × 6–10 μ, basales anguste rectangulatae, 35–60 × 10–12 μ, trigonis majusculis, quadratim confluentibus, culcuticula levi.

Migothang, 3900 m (May 31, 1960; no. 201199—type in herb. NICH; dupl. in TI); Phalut–Sandakphu, 3200–3550 m (Jun. 6, 1960; no. 201002); Siling Tzokupa, 2000–3000 m (Nov. 21, 1963; no. 237081).

Distr. Endemic.

Marsupella revoluta (Nees) Lindb. in Medd. Soc. Faun. Fl. Fenn. **13**: 238 (1886)–*Sarcoscyphus revolutus* Nees, Naturg. Eur. Leberm. **2**: 419 (1836)–*Jungermannia atrata* Mitt. (1861)–*Acolea atrata* (Mitt.) Steph. (1901)–*Gymnomitrion reflexifolium* Horik. (1934).

Phalut, 3550 m (May 10, 1960); Jongri, 4000–4200 m (May 22, 1960); Jongri–Choktschering Chu, 4000–4300 m (May 25, 1960); Sandakphu–Tonglu, 2600–3550 m (June 7, 1960).

Distr. Himalaya, Formosa, Japan, Europe, and N. America.

This species is essentially alpine (not arctic), occurring on the rocks in montane or alpine areas of Asia.

PLEUROZIACEAE

Pleurozia purpurea (Lightf.) Lindb. in Act. Soc. Faun. Fl. Fenn. **1** (2): 27 (1877).

Jongri, 4000 m (May 20 & 22, 1960).

Distr. Himalaya, Formosa, Japan, ?Hawaii, Pacific coast of N. America (Anchorage to British Columbia), ?Guadaloupe, Scotland, Scandinavia, Faeroes, and Denmark.

The family Pleuroziaceae is well-developed in the tropic, and the present species is a sole representative of the family in the temperate to subalpine areas of the

Northern Hemisphere, where this species is disjunctively distributed in the above-cited places and is considered to be a relict.

RADULACEAE

Radula (subg. Cladoradula) **Boryana** (Web.) Nees in Gott., Lindenb. & Nees, Syn. Hepat. 254 (1845).

Senchal–Tiger Hill, 2400–2500 m (Apr. 11, 1960; no. 201107).

Distr. Sikkim, China, Korea, Japan, Madagascar, S. Africa, Mexico, and C. & S. America. New to Himalaya.

Radula (subg. Radula) **tjibodensis** Goebel in Ann. Jard. Bot. Buitenz. **7**: 53 & 60 (1887), sine descr. lat.-Schiffn. in Nova Act. Acad. Caes. Leop.-Carol. **60** (2): 249 (1893).

Takdah, 1600–1700 m (Apr. 18, 1960; no. 200138).

Distr. Sikkim, Java, Philippines, New Guinea, and Samoa. New to Himalaya.

PORELLACEAE

Porella appendiculata (Steph.) Hattori, comb. nov.–*Madotheca appendiculata* Steph., Sp. Hepat. **4**: 301 (1910).

Walunchung Gola–Zongi, 2700–2800 m (Nov. 11, 1963); Iladanda–Helok, 1500–1900 m (Nov. 13, 1963); E. Nepal, sine loco speciali.

Distr. Himalaya, Mussoorrie, Punjab Plain, and China (Yunnan, Szechuan).

This species is very closely related to Japanese *Porella densifolia* (Steph.) Hatt. and may possibly be regarded to be a subspecies of the latter. Chinese *Madotheca fallax* Mass. is more closely related to *Porella densifolia* and is better treated as a subspecies of the latter: *Porella densifolia* (Steph.) Hatt. in Journ. Jap. Bot. **20**: 109 (1944)–*Madotheca densifolia* Steph. in Mem. Soc. Sci. Nat. Math. Cherbourg **29**: 219 (1894).—subsp. **fallax** (Mass.) Hattori, comb. nov.–*Madotheca fallax* Mass. in Nuovo Giorn. Accad. Verona ser. 3, **73**, fasc. 2: 30 (1897).

Porella campylophylla (Lehm. et Lindenb.) Trev. in Mem. Real. Istit. Lombardo, Sci. Lett. ser. 3, **4**: 408 (1877)–*Jungermannia campylophylla* Lehm. et Lindenb. in Lehm., Pugillus **6**: 40 (1834)–*Madotheca campylophylla* (Lehm. et Lindenb.) Gott., Lindenb. & Nees, Syn. Hepat. 265 (1845).

Darjeeling, 2000–2200 m (Apr. 2, 1960); Ramam, 2400 m (May 8, 1960); Phalut, 3550 m (May 10, 1960); Yoksam, 1700 m (May 17, 1960); Iladanda–Selap, 1800 2600 m (Nov. 9, 1963); Helok–Baroya Khimty, 1500–2500 m (Nov. 15, 1963); near Chyangthaphu–Birwa, 1100–1200 m (Nov. 27, 1963); Bhuspate Danra, 2600 m (Dec. 2, 1963); Bhuspate Danra–Mai Majuwa, 1600–2900 m (Dec. 3, 1963); E. Nepal, sine loco speciali.

Distr. Himalaya, Bengal, Punjab Plain, Burma, and S. India.

The marginal teeth of leaves and underleaves are variable in number.

Porella frullanioides (Steph.) Hattori, comb. nov.–*Madotheca frullanioides* Steph., Sp. Hepat. **4**: 310 (1910).

Selap–Walunchung Gola, 2600–3200 m (Nov. 10, 1963; no. 236381).

Distr. E. Nepal, and China (Ventzehay). New to Himalaya.

This species is very close to *Porella propinqua* (Mass.) Hattori, comb. nov.

[*Madotheca propinqua* Mass. in Nouvo Giorn. Accad. Verona ser. 3, **73**, fasc. **2**: 27 (1897)], but is different from the latter with its triangular-ovate leaf-lobule whose lateral margins are so strongly reflexed that the apex becomes triangular and obtuse to acute.

Porella ligulifera (Tayl.) Trev. in Mem. Real. Istit. Lombardo Sci. Lett. ser. 3, **4**: 408 (1877)-*Madotheca ligulifera* Tayl. in Lehm., Pugillus **8**: 10 (1844).

Phalut-Dentam, 1450–3630 m (May 11, 1960); Yoksam, 1700 m (May 17, 1960); Gangtok, 1750 m (Jun. 14, 1960); below Siling Tzokupa–Khebang, 1500–2000 m (Nov. 22, 1963); Birwa–Yektin, 1200–2500 m (Nov. 28, 1963).

Distr. Nepal, Sikkim, and Java.

Porella nitens (Steph.) Hattori, comb. nov.-*Madotheca nitens* Steph. in Mem. Soc. Nat. Math. Cherbourg **29**: 220 (1894).

Helok, 1500 m (Nov. 8, 1963; no. 236243).

Distr. E. Nepal, and China (Yunnan). New to Himalaya.

Porella revoluta (Lehm. et Lindenb.) Trev. in Mem. Real. Istit. Lombardo Sci. Lett. ser. 3, **4**: 407 (1877)-*Jungermannia revoluta* Lehm. et Lindenb. in Lindenb., Pugillus **4**: 18 (1832)-*Madotheca revoluta* Lehm. et Lindenb. in Gott., Lindenb. & Nees, Syn. Hepat. 273 (1845).

Iladanda–Helok, 1500–1900 m (Nov. 13, 1963; nos. 236576, 237822).

Distr. Himalaya, and China (N. W. Yunnan).

Porella urophylla (Mass.) Hatt. in Bull. Sci. Mus. Tokyo **11**: 93 (1944), excl. plant. japon.

Below Bakkim–Jongri, 2200–4000 m (May 19, 1960; no. 201240).

Distr. Sikkim, China (Shensi), and Tonkin. New to Himalaya.

This species is very closely related to Japanese *Porella setigera* (Steph.) Hatt. and seems to be conspecific with it.

FRULLANIACEAE

Frullania Delavayi Steph. in Mem. Soc. Sci. Nat. Math. Cherbourg **29**: 212 (1894).

Preig Chu–Jongri, 3600–4000 m (May 19, 1960); below Bakkim–Jongri, 2200–4000 m (May 19, 1960); Jongri–Olothang, 3600–4000 m (May 23, 1960); Hati Sar–Minchin Dhap, 2600–3000 m (Oct. 28, 1963); Walunchung Gola–Zongi, 2700–3800 m (Nov. 11, 1963); Siling Tzokupa, 2000–3000 m (Nov. 21, 1963).

Distr. E. Nepal, Sikkim, China (Yunnan, Szechuan), and Japan (excl. Hokkaido). New to Himalaya.

Frullania Duthiana Steph., Sp. Hepat. **4**: 351 (1910).

Phalut, 3550 m (May 8, 1960); Jongri, 4000–4200 m (May 21, 1960); Sandakphu–Tonglu, 2600–3550 m (Jun. 7, 1960).

Distr. Himalaya (Kidarkanta, and Sikkim).

Frullania Gaudichaudii (Nees et Mont.) Nees et Mont. in Gott., Lindenb. & Nees, Syn. Hepat. 435 (1845).

Darjeeling, 2000–2200 m (May 21, 1960).

Distr. India, Sikkim, Indonesia, Borneo, Philippines, Japan (Amami-oshima I.), Formosa, New Guinea, New Caledonia, and ?Brasil.

Frullania Giraldiana Mass. in Mem. Accad. Agr. Art. Verona **73**: 41 (1897).

Zongi–Iladanda, 1800–2700 m (Nov. 12, 1963; no. 236556).

Distr. E. Nepal, and China (Shensi, and Szechuan). New to Himalaya.

Very close to, or conspecific with *F. nepalensis* (Spreng.) Lehm. et Lindenb.

Frullania Grevilleana Tayl. in Gott., Lindenb. & Nees, Syn. Hepat. 421 (1845).

Darjeeling, 2000–2200 m; Darjeeling–Senchal, 2150–2400 m; Batasi, 2150 m; Batasi–Palmajua, 2150–2300 m; Rimbick, 2200 m; Rimbick–Ramam, 1900–2400 m; Ramam, 2400 m; Sandakphu–Tonglu, 2800–3550 m; Phalut, 3550 m; Phalut–Sandakphu, 3200–3550 m; Chia Bhanjang–Dentam, 1400–3100 m; Jongri, 4000–4200 m; Bilbatay Bhanjang, 2200 m; Bilbatay Bhanjang–Hati Sar, 2200–3000 m; Hati Sar–Minchin Dhap, 2600–3000 m; Minchin Dhap–Mul Pokhari, 2400–2800 m; Taplejung, 1700 m; Taplejung–Garhi Danra, 1700–2000 m; Iladanda–Helok, 1500–1900 m; Helok–Baroya Khimty, 1900–2500 m; Zongi–Iladanda, 1800–2700 m; Selap–Walunchung Gola, 2600–3200 m; Walunchung Gola–Zongi, 2700–3800 m; Baroya Khimty–Thakma Khola, 2500–3000 m; Siling Tzokupa, 2000–3000 m; near Chyangthaphu–Birwa, 1100–2100 m; Birwa–Yektin, 1200–2500 m; Batasay–Bhuspate Danra, 2300–2600 m; Bhuspate Danra, 2600 m; Bhuspate Danra–Mai Majuwa, 1600–2900 m.

Distr. E. Himalaya.

This species is one of the most common hepatics in this area, and may be a representative species of Himalayan Frullanias.

Frullania muscicola Steph. in Hedwigia **33**: 146 (1894).

Batasay–Bhuspate Danra, 2300–2600 m (Dec. 1, 1963; no. 237316).

Distr. Himalaya, Punjab Plain, China, Manchuria, Saghalin, Japan, Korea, and Formosa.

Frullania nepalensis (Spreng.) Lehm. et Lindenb. in Gott., Lindenb. & Nees, Syn. Hepat. 422 (1845).

Darjeeling, 2000–2200 m (Apr. 2 & 8, 1960); Phalut, 3550 m (May 10, 1060); Yoksam, 1700 m (May 17, 1960); below Bakkim–Jongri, 2200–4000 m (May 19, 1960); Sandakphu–Tonglu, 2600–3550 m (Jun. 7, 1960); Dhankuta, 1200 m (Oct. 1963); Bilbatay Bhanjang, 2200 m (Oct. 25 & 26, 1963); Bilbatay Bhanjang–Hati Sar, 2200–3000 m (Oct. 27, 1963); Hati Sar–Minchin Dhap, 2600–3000 m (Oct. 28, 1963); Minchin Dhap–Mul Pokhari, 2400–2800 m (Oct. 29, 1963); Helok, 1500 m (Nov. 7, 1963); Selap–Walunchung Gola, 2600–3200 m (Nov. 10, 1963); Baroya Khimty–Thakma Khola, 2500–3000 m (Nov. 12 & 16, 1963); Iladanda–Helok, 1500–1900 m (Nov. 13, 1963); Yamphodin–Ghatte, 1600–2100 m (Nov. 18, 1963); Khebang–below Siling Tzokupa, 1500–2000 m (Nov. 20, 1963); Batasay–Bhuspate Danra, 2300–2600 m (Dec. 1, 1963); Bhuspate Danra, 2600 m (Dec. 2, 1963); Mai Pokhari, 1500–1900 m (Dec. 4, 1963).

Distr. E. Himalaya, Bengal, Thai, W. China (Yunnan, Szechuan), Sumatra, Celebes, Philippines, Batjan I., ?Korea, and Japan (excl. Hokkaido).

This species is very close to, or conspecific with, *F. Grevilleana* Tayl. and is also common in this area.

Frullania neurota Tayl. in London Journ. Bot. **5**: 400 (1846).

Darjeeling, 2000–2200 m (Apr. 2, 1960); Yoksam, 1700 m (May 17, 1960); Dhankuta, 1200 m (Oct. 21, 1963); Bilbatay Bhanjang, 2200 m (Oct. 25, 1963); Hati Sar–Minchin Dhap, 2600–3000 m (Oct. 28, 1963); Minchin Dhap–Mul Pokhari, 2400–2800 m (Oct. 29, 1963); Siling Tzokupa, 2000–3000 m (Nov. 21, 1963); Batasay–

Bhuspate Danra, 2300–2600 m (Dec. 1, 1963); Bhuspate Danra, 2600 m (Dec. 2, 1963).

Distr. Nepal, Sikkim, India, Ceylon, Java, China, Hawaii, and ?Mexico.

Frullania nishiyamensis Steph. in Bull. Herb. Boiss. **5**: 90 (1897).

Bilbatay Bhanjang, 2200 m (Oct. 25, 1963); Hati Sar–Minchin Dhap, 2600–3000 m (Oct. 28, 1963); Iladanda–Helok, 1500–1900 m (Nov. 13, 1963).

Distr. E. Nepal, China, Formosa, Korea, and Japan. New to Himalaya.

Very closely related to, or conspecific with, *F. nepalensis* (Spreng.) Lehm. et Lindenb.

Frullania physantha Mitt. in Journ. Linn. Soc. **5**: 121 (1861).

Darjeeling, 2000–2200 m (Apr. 8, 1960); Victoria Falls, Darjeeling, 1950 m (Apr. 8, 1960); Rimbick, 2200 m (May 6, 1960); Phalut, 3550 m (May 10 & June 4–5, 1960); Pamianchi, 2000 m (May 13, 1960); Pamianchi–Gayzing Bazar, 1550–2000 m (May 13, 1960); Migothang–Nayathang, 3300–3900 m (Jun. 1, 1960); Gangtok, 1750 m (Jun. 13, 1960); Bilbatay Bhanjang, 2200 m (Oct. 25 & 26, 1963); Bilbatay Bhanjang–Hati Sar, 2200–3000 m (Oct. 27, 1963); Minchin Dhap–Mul Pokhari, 2400–2800 m (Oct. 29, 1963); Taplejung–Garhi Danra, 1700–2000 m (Nov. 3, 1963); Iladanda–Helok, 1500–1900 m (Nov. 13, 1963); Yamphodin–Ghatte, 1600–2100 m (Nov. 18, 1963); Bhuspate Danra–Mai Majuwa, 1600–2900 m (Dec. 3, 1963).

Distr. E. Himalaya, Bengal, Khasia, and China (Hunan).

This is a unique species representing Himalayan Frullanias with the large perianths inflated below, the rounded underleaves, and the frequent occurrence in this area.

Frullania retusa Mitt. in Journ. Linn. Soc. **5**: 119 (1861).

Senchal–Tiger Hill, 2400–2500 m (Apr. 16, 1960); Sandakphu–Tonglu, 2800–3550 m (Jun. 7, 1960); Hati Sar–Minchin Dhap, 2600–3000 m (Oct. 28, 1963); Iladanda–Selap, 1800–2600 m (Nov. 9, 1963); Birwa–Yektin, 1200–2500 m (Nov. 28, 1963).

Distr. Himalaya.

This species resembles Japanese *Frullania japonica* Sde. Lacoste in sterile state, but the latter has usually large imbricate leaves and underleaves, and smooth perianths. When fertile *F. retusa* is easily distinguished by its toothed perianths.

Frullania schensiana Mass. in Mem. Accad. Agr. Verona **73** (3): 40 (1897).

Senchal–Tiger Hill, 2500 m (Apr. 16, 1960); Yoksam, 1700 m (May 17, 1960); Sandakphu–Tonglu, 2800–3550 m (Jun. 7, 1960); Walunchung Gola–Zongi, 2700–2800 m (Nov. 11, 1963); Iladanda–Helok, 1500–1900 m (Nov. 13, 1963).

Distr. Nepal, Sikkim, China (Shensi et al.), Formosa, Korea, and Japan. New to Himalaya.

Frullania squarrosa (Reinw., Blume et Nees) Nees in Gott., Lindenb. & Nees, Syn. Hepat. 416 (1845).

Darjeeling, 2000–2200 m (Apr. 8, 1960); Kurseong, 1550 m (Apr. 12, 1960); Lopchu, 1500 m (Apr. 28, 1960); Pamianchi, 2000 m (May 13, 1960); Yoksam, 1700 m (May 17, 1960); Gangtok, 1900 & 1750 m (Jun. 13 & 14, 1960); Darjeeling–Senchal, 2150–2500 m (Jun. 23, 1960); Kathmandu Airport, 1400 m (Oct. 14, 1966); Dhankuta, 1200 m (Oct. 19, 1963); Bilbatay Bhanjang, 2200 m (Oct. 26, 1963); Hati Sar–Minchin Dhap, 2600–3000 m (Oct. 28, 1963); Taplejung–Garhi Danra, 1700–2000 m (Nov. 3, 1963); Iladanda–Selap, 1800–2600 m (Nov. 9, 1963); Zongi–Iladanda, 1800–2700 m (Nov. 12, 1963); Khebang–below Siling Tzokupa, 1500–2000 m (Nov. 20, 1963); near Chyangthaphu–Birwa, 1100–2100 m (Nov. 27, 1963); Batasay–Bhuspate Danra, 2300–

2600 m (Dec. 1, 1963); Bhuspate Danra–Mai Majuwa, 1600–2900 m (Dec. 3, 1963); Bhandukay Bhanjang–Mai Majuwa, 1600–2900 m (Dec. 3, 1963).

Distr. Widely distributed in Asia, Pacific Is., Australia, N. & S. America, and Africa (warm-temperate to tropical regions).

Frullania Tamarisci (L.) Dum., Rec. d'Obs. 13 (1835)–*Jungermannia Tamarisci* L., Sp. Pl. 1134 (1753)–*Jungermannia moniliata* Reinw., Blume et Nees in Nova Act. Acad. Caes. Leop.-Carol. **12** (1): 224 (1824)–*Frullania moniliata* (Reinw., Blume et Nees) Mont. in Ann. Sci. Nat. ser. 2, **18**: 13 (1842)–Nees in Gott., Lindenb. et Nees, Syn. Hepat. 440 (1845), syn. nov.

Rimbick, 2200 m (May 6, 1960; no. 201213); Batasi, 2150 m (May 16, 1960; no. 201091).

Distr. Europe, Asia Minor, Himalaya, India, Ceylon, Malaysia, China, Formosa, Korea, temperate Siberia, Japan, and ?Vancouver & Orcas Is. New to Himalaya.

Some North American species are also conspecific with this species, and should be treated as follows:

Frullania Tamarisci (L.) Dum. subsp. **Asagrayana** (Mont.) Hattori, comb. nov. *Frullania Asagrayana* Mont. in Ann. Sci. Nat. ser. 2, **18**: 14 (1842). *Frullania Grayana* Sull. in Gray, Manual of Bot. ed. 2, 697 (1856). Type loc.: Grandfather Mt., North Carolina. Distr. N. America (excl. Mexico and the Pacific coast of America).

Frullania Tamarisci (L.) Dum. subsp. **nisquallensis** (Sull.) Hattori, comb. nov. *Frullania nisquallensis* Sull. in Mem. Amer. Acad. Arts & Sci. ser. 2, **4**: 175 (1849). *Frullania Franciscana* Howe in Erythea **2**: 99 (1894), syn. nov.; *Frullania unciflora* var. *californica* Gott. in Bolander, nom. nud.–*Frullania Grayana* var. *californica* Aust. ex Underw. in Bull. Illinois State Lab. Nat. Hist. **2**: 67 (1884), p.p. Type loc.: Fort Nisqually, Washington. Distr. Pacific coast of North America (Alaska, British Columbia, Washington, Oregon, California).

The records of *Frullania Tamarisci* in Vancouver and Orcas Is. seem to be corrected as *F. Tamarisci* subsp. *nisquallensis.*

Frullania Wallichiana Mitt. in Journ. Linn. Soc. **5**: 118 (1861).

Darjeeling, 2000–2200 m (Apr. 2 & 8, 1960); Victoria Falls, Darjeeling, 1950 m (Apr. 3, 1960); Kurseong, 1550 m (Apr. 12, 1960); Darjeeling–Senchal, 2200–2400 m (Apr. 15, 1960); Senchal, 2400 m (Apr. 17, 1960); Yoksam, 1700 m (May 17, 1960); Gangtok, 1900 & 1750 m (Jun. 13 & 14, 1960); Bilbatay Bhanjang, 2200 m (Oct. 25 & 26, 1963); Hati Sar–Minchin Dhap, 2600–3000 m (Oct. 28, 1963); Minchin Dhap–Mul Pokhari, 2400–2800 m (Oct. 29, 1963); Taplejung–Garhi Danra, 1700–2000 m (Nov. 3, 1963); Baroya Khimty–Thakma Khola, 2500–3000 m (Nov. 12 & 16, 1963); Iladanda–Helok, 1500–1900 m (Nov. 13, 1963); near Chyangthaphu–Birwa, 1100–2100 m (Nov. 27, 1963); Bhuspate Danra–Mai Majuwa, 1600–2900 m (Dec. 3, 1963).

Distr. Himalaya, India, Sumatra, Java, and Philippines. New to Himalaya.

Frullania yunnanensis Steph. in Mem. Soc. Sci. Nat. Math. Cherbourg **29**: 214 (1894).

Darjeeling, 2000–2200 m (Apr. 2 & 8, 1960); Victoria Falls, Darjeeling, 1950 m (Apr. 3, 1960); Senchal Rest House–Ghum, 2200–2400 m (Apr. 6, 1960); Senchal, 2400 m (Apr. 16 & 17, 1960); Senchal–Tiger Hill, 2400–2500 m (Apr. 16, 1960); Takdah, 1600–1700 m (Apr. 18, 1960); Palmajua–Rimbick, 2200–2300 m (May 5, 1960); Rimbick, 2200 m (May 6, 1960); Phalut, 3550 m (May 10, 1960); Yoksam, 1700 m (May 17, 1960); Preig Chu–Jongri, 2200–4000 m (May 19, 1960); Jongri, 4000 m (May 20 & 21, 1960); Jongri–Olothang, 3600–4000 m (May 23, 1960); Migothang–Nayathang, 3300–3900 m (Jun. 1, 1960); Hati Sar–Zongi, 2700–3800 m (Oct. 28, 1963); Selap–Walunchung Gola, 2600–3200 m (Nov. 10, 1963); Walunchung Gola–Zongi, 2700–3800 m (Nov. 11, 1963); Baroya Khimty–Thakma Khola, 2500–3000 m (Nov. 12 & 16, 1963); Birwa–Yektin, 1200–2500 m (Nov. 28, 1963); Batasay–Bhuspate Danra, 2300–2600 m (Dec. 1, 1963); Bhuspate Danra, 2600 m (Dec. 2, 1963); Mai Majuwa–Dhara Pani, 1500–1900 m (Dec. 4, 1963).

Distr. Himalaya, and China (Yunnan). New to Himalaya.

One of the most frequent Frullanias in this area; closely related to *Frullania Grevilleana* Tayl. and distinguished from the latter only by the rounded underleaves whose apex is never bifid.

JUBULACEAE

Subfam. Jubuloideae

Jubula Hutchinsiae (Hook.) Dum. subsp. **javanica** (Steph.) Verd. in Ann. Crypt. Ex. **1**: 216 (1928)–*Jubula javanica* Steph., Sp. Hepat. **4**: 688 (1911).

Senchal, 2300 m (Apr. 6, 1960; no. 209524).

Distr. ?Asia Minor to Caucasus, India, Malaysia, Philippines, New Guinea, Samoa, Formosa, and Japan.

This subspecies is separable from subsp. *Hutchinsiae* by its leaf-lobules lacking sharp-pointed beak at the apex.

Subfam. Lejeuneoideae

Cheilolejeunea Giraldiana (Mass.) Mizut. in Journ. Hattori Bot. Lab. **27**: 141 (1964).

Senchal, 2400 m (Apr. 16, 1960); Senchal–Tiger Hill, 2400–2500 m (Apr. 16, 1960); Bilbatay Bhanjang, 2200 m (Oct. 25, 1963).

Distr. E. Nepal, Sikkim, and China (Shensi). New to Himalaya.

Cheilolejeunea imbricata (Nees) Hatt. in Misc. Bryol. Lichenol. **1** (14): 1 (1957).

Bilbatay Bhanjang, 2200 m (Oct. 25, 1963); Hati Sar–Minchin Dhap, 2600–3000 m (Oct. 28, 1963); Bhuspate Danra–Mai Majuwa, 1600–2900 m (Dec. 3, 1963); Mai Majuwa–Dhara Pani, 1500–1900 m (Dec. 4, 1963).

Distr. Warm-temperate to tropic regions of Asia, including Japan, and Pacific islands.

Cheilolejeunea laeviuscula (Mitt.) Steph., Sp. Hepat. **5**: 668 (1914).

Bilbatay Bhanjang–Hati Sar, 2200–3000 m (Oct. 27, 1963; no. 235945).

Distr. E. Nepal, Sikkim, and Bengal.

Cheilolejeunea subopaca (Mitt.) Mizut. in Journ. Hattori Bot. Lab. **26**: 183 (1963).

Senchal–Tiger Hill, 2400–2500 m (Apr. 16, 1960); Phalut, 3550 m (May 10, 1960); below Bakkim–Jongri, 2200–4000 m (May 19, 1960); Sandakphu–Tonglu, 2800–3550 m (Jun. 7, 1960); Darjeeling–Senchal, 2150–2500 m (Jun. 23, 1960); Hati Sar–Minchin Dhap, 2600–3000 m (Oct. 28, 1963); Baroya Khimty–Thakma Khola, 2500–3000 m

(Nov. 16, 1963); Siling Tzokupa, 2000–3000 m (Nov. 21, 1963); Birwa–Yektin, 1200–2500 m (Nov. 28, 1963); Bhuspate Danra–Mai Majuwa, 1600–2900 m (Dec. 3, 1963); Mai Pokhari, 1500–1900 m (Dec. 4, 1963).

Distr. Nepal, Sikkim, and Khasia. New to Himalaya.

Dicranolejeunea javanica Steph., Sp. Hepat. **5**: 169 (1912).

Bilbatay Bhanjang, 2200 m (Oct. 25, 1963); Bilbatay Bhanjang–Hati Sar, 2200–3000 m (Oct. 27, 1963); Hati Sar–Minchin Dhap, 2600–3000 m (Oct. 28, 1963); Minchin Dhap–Mul Pokhari, 2400–2800 m (Oct. 29, 1963).

Distr. E. Nepal, Sumatra, and Java. New to Himalaya.

Drepanolejeunea angustifolia (Mitt.) Grolle in Journ. Jap. Bot. **40**: 206 (1965)–*Lejeunea angustifolia* Mitt. in Journ. Linn. Soc. **5**: 116 (1861)–*Drepanolejeunea tenuis* (Reinw., Blume et Nees) Schiffn. [Basionym is *Jungermannia tenuis* Reinw., Blume et Nees (1824), non *J. tenuis* Ehrh. (1789), thus a later homonym].

Rimbick, 2000 m (May 6, 1960); Sandakphu–Tonglu, 2800–3550 m (Jun. 7, 1960); Hati Sar–Minchin Dhap, 2600–3000 m (Oct. 28, 1963).

Distr. Himalaya, Java, Sumatra, Borneo, Philippines, China, Bonin Is., Formosa, and Japan (excl. Hokkaido).

Drepanolejeunea monophthalma (Herz.) Mizutani, comb. nov.–*Strepsilejeunea monophthalma* Herz. in Hand.-Mzt., Symb. Sin. **5**: 47 (1930)–*Drepanolejeunea japonica* Horik. in Journ. Sci. Hirosh. Univ. ser. b., div. 2, **1**: 202 (1933), syn.nov. –*Strepsilejeunea denticulata* Kamim., Contr. Fl. Hepat. Shikoku. 115 (1952), syn. nov.

Ramam, 2400 m (May 8, 1960); Pamianchi–Gayzing Bazar, 1550–2000 m (May 13, 1960); Gangtok, 1750 & 1900 m (Jun. 13 & 17, 1960); Helok–Baroya Khimty, 1500–2500 m (Nov. 10 & 15, 1963); Baroya Khimty–Thakma Khola, 2500–3000 m (Nov. 12 & 16, 1963); Birwa–Yektin, 1200–2500 m (Nov. 28, 1963).

Distr. E. Nepal, Sikkim, China (Yunnan), and Japan. New to Himalaya.

Lejeunea appendiculata Mitt. in Journ. Linn. Soc. **5**: 113 (1861).

Sandakphu–Garibans, 2800–3550 m (Jun. 1, 1960); Chia Bhanjang, 3100 m (Jun. 2, 1960); Sandakphu–Tonglu, 2800–3550 m (Jun. 7, 1960); Dhankuta, 1200 m (Oct. 21, 1963); Bilbatay Bhanjang, 2200 m (Oct. 25, 1963); Bilbatay Bhanjang–Hati Sar, 2200–3000 m (Oct. 27, 1963); Hati Sar–Minchin Dhap, 2600–3000 m (Oct. 28, 1963); Minchin Dhap–Mul Pokhari, 2400–2800 m (Oct. 29, 1963); near Chyangthaphu–Birwa, 1100–2100 m (Nov. 27, 1963); Batasay–Bhuspate Danra, 2300–2600 m (Dec. 1, 1963); Bhuspate Danra, 2600 m (Dec. 2, 1963).

Distr. E. Nepal, and Sikkim.

Lejeunea bidentula Herz. in Hand.-Mzt., Symb. Sin. **5**: 51 (1930).

Dhankuta, 1200 m (Oct. 21, 1963); Bilbatay Bhanjang, 2200 m (Oct. 25, 1963).

Distr. E. Nepal, and China. New to Himalaya.

Lejeunea Kodamae Ikeg. et Inoue (1961), a rare Japanese species, seems to be conspecific with the present species.

Lejeunea Mittenii Mizut. in Journ. Hattori Bot. Lab. **28**: 121 (1965)–*L. flexuosa* Mitt. in Journ. Linn. Soc. **5**: 114 (1861); non Lindenb. in Gott., Lindenb. et Nees, Syn. Hepat. 385 (1845).

Senchal, 2400 m (Apr. 16, 1960); Senchal–Tiger Hill, 2400–2500 m (Apr. 16, 1960); Palmajua–Rimbick, 1400–2300 m (May 5, 1960); Phalut–Dentam, 1450–3550 m (May 11, 1960); Tingling Bridge–Yoksam, 1000–1700 m (May 16, 1960); Yoksam, 1700 m (May 17, 1960); Yoksam–below Bakkim, 1700–2200 m (May 18, 1960); below Bakkim-Jongri, 2200–4000 m (May 19, 1960); Sandakphu-Tonglu, 2800–3550 m (Jun. 7, 1960); Darjeeling, 2000–2200 m (Jun. 22, 1960); Darjeeling-Senchal-Tiger Hill, 2150–2500 m (Jun. 23, 1960); Happy Valley, Darjeeling (Jun. 26, 1960); Bilbatay Bhanjang–Hati Sar, 2200–3000 m (Oct. 27, 1963); Taplejung, 1700 m (Nov. 2, 1963); Zongi–Iladanda, 1800–2700 m (Nov. 12, 1963); Helok–Baroya Khimty, 1500–2500 m (Nov. 15, 1963); Baroya Khimty–Thakma Khola, 2500–3000 m (Nov. 16, 1963); Siling Tzokupa, 2000–3000 m (Nov. 21, 1963); Birwa–Yektin, 1200–2500 m (Nov. 28, 1963); Batasay–Bhuspate Danra, 2300–2600 m (Dec. 1 & 2, 1963).

Distr. E. Himalaya, Bengal, Assam, and Burma.

Lejeunea (Microlejeunea) **punctiformis** Tayl. in London Journ. Bot. **5**: 398 (1846)–*L. gracillima* Mitt. in Journ. Linn. Soc. **5**: 115 (1861), syn. nov.

Rimbick, 2200 m (May 6, 1960).

Distr. Sikkim, India, Ceylon, Formosa, and Japan.

Lejeunea subolivacea Mizut. in Journ. Hattori Bot. Lab. **28**: 121 (1965)–*L. olivacea* Steph. in Hedwigia **29**: 137 (1890); non Gott. in Gott., Lindenb. et Nees, Syn. Hepat. 363 (1845).

Darjeeling, 2000 m (Jun. 21, 1960; no. 200112).

Distr. Sikkim.

Lejeunea Wightii Lindenb. in Gott., Lindenb. et Nees, Syn. Hepat. 379 (1845).

Victoria Falls, Darjeeling, 1950 m (Apr. 3, 1960); Tenzing Norkay Road–Birch Hill, 2000 m (Apr. 5, 1960); Palmajua–Rimbick, 1400–2300 m (May 5, 1960); Batasi, 2150 m (May 6, 1960); Phalut, 3550 m (May 10, 1960); Pamianchi, 2000 m (May 13, 1960); Pamianchi–Gayzing Bazar, 1550–2000 m (May 13, 1960); Tingling Bridge–Yoksam, 1000–1700 m (May 16, 1960); Yoksam, 1700 m (May 17, 1960); Gangtok, 1900 & 1750 m (Jun. 13 & 14, 1960); Darjeeling–Tiger Hill, 2150–2500 m (Jun. 23, 1960); Bilbatay Bhanjang, 2200 m (Otc. 25, 1963); Minchin Dhap–Mul Pokhari, 2400–2800 m (Oct. 29, 1963); Siling Tzokupa, 2000–3000 m (Nov. 21, 1963); Bhuspate Danra–Mai Majuwa, 1600–2900 m (Dec. 3, 1963).

Distr. E. Nepal, Sikkim, India, and Formosa (Botel Tobago I.).

Lopholejeunea subfusca (Nees) Steph. in Hedwigia **29**: 16 (1890).

Darjeeling, 2000 m (Apr. 2, 1960); Pamianchi, 2000 m (May 13, 1960); Yoksam, 1700 m (May 17, 1960); Gangtok, 1900–1750 m (Jun. 13 & 14, 1960); Darjeeling–Tiger Hill, 2150–2500 m (Jun. 23, 1960); Bilbatay Bhanjang–Hati Sar, 2200–3000 m (Oct. 27, 1963); Minchin Dhap–Mul Pokhari, 2400–2800 m (Oct. 29, 1963); Helok–Baroya Khimty, 1500–2500 m (Nov. 10 & 15, 1963); Baroya Khimty–Thakma Khola, 2500–3000 m (Nov. 16, 1963); Yamphodin–Ghatte, 1600–2100 m (Nov. 18, 1963); Ghatte–Khebang, 1600–2200 m (Nov. 19, 1963); Mai Majuwa–Dhara Pani, 1500–1900 m (Dec. 4, 1963).

Distr. Tropical to subtropical Asia and Pacific islands, extending southward to New Guinea, and Tahiti, and northwards to Formosa, and Japan, ?S. Africa.

Neotropic *Lopholejeunea Sagraeana* (Mont.) Schiffn. may be closely related to, or conspecific with, the present species. Another neotropic species, *L. Muelleriana* (Gott.) Schiffn. may possibly be a form of *L. Sagraeana*.

Ptychanthus striatus (Lehm. et Lindenb.) Nees, Naturg. Europ. Leberm. **3**: 212 (1838).

Darjeeling, 2000–2200 m; Victoria Falls, Darjeeling, 1950 m; Happy Valley, Darjeeling; Darjeeling–Senchal, 2150–2500 m; Senchal, 2400 m; Senchal Rest House–Ghum, 2200–2400 m; Senchal–Tiger Hill, 2400–2500 m; Kurseong, 1550 m; Takdah, 1600–1700 m; Gangtok, 1900 m; Penlong La, near Gangtok, 2100 m; Lopchu, 1500 m; Batasi, 2150 m; Batasi–Palmajua, 2150–2300 m; Palmajua–Rimbick, 1500–2300 m; Rimbick, 2200 m; Pamianchi, 2000 m; Pamianchi–Gayzing Bazar, 1500–2000 m; Yoksam, 1700 m; Sandakphu–Tonglu, 2600–3440 m; Garibans–Tonglu, 2600–3000 m; below Bakkim–Jongri, 2200–4000 m; Migothang–Nayathang, 3300–3900 m; Bilbatay Bhanjang, 2200 m; Bilbatay Bhanjang–Hati Sar, 2200–3000 m; Hati Sar–Minchin Dhap, 2600–3000 m; Minchin Dhap–Mul Pokhari, 2400–2800 m; Mul Pokhari–Dumhan, 700–2400 m; Taplejung, 1700 m; Taplejung–Garhi Danra, 1700–2000 m; Iladanda–Helok, 1500–1900 m; Helok, 1500 m; Helok–Baroya Khimty, 1500–2500 m; Selap–Walunchung Gola, 2600–3200 m; Walunchung Gola–Zongi, 2700–3800 m; Zongi–Iladanda, 1800–2700 m; Baroya Khimty–Thakuma Khola, 2500–3000 m; Yamphodin–Ghatte, 1600–2100 m; below Siling Tzokupa, 1500–2000 m; Khebang, 1500 m; near Chyangthaphu–Birwa, 1100–2100 m; Birwa–Yektin, 1200–2500 m; Mai Pokhari, 1500–1900 m; Batasay–Bhuspate Danra, 2300–2600 m.

Distr. Asia, and Africa (usually subtropical to warm-temperate regions), Pacific islands (probably very rare) northwards to Middle Japan.

Verdoorn (1934) considered *Ptychanthus intermedius* geographically covering Pacific Islands, New Zealand and Australia to be a variety of the present species. In our area *Ptychanthus striatus* most frequently occurs below 3000 m, in particular between 1500 and 2500 m above sea level. I found more than 150 collections which belong to this species.

Ptychocoleus sikkimensis Mizutani, sp. nov.

Planta minor, brunnea; caulis flaccidus, irregulariter ramosus; folia imbricata, amphigastria contigua, rotundata, integerrima; perianthia in ramis terminalia, innovatione nulla, in situ oblonga, 5-plicata, plicis nudis. A *Ptychocoleo nipponico* differt dentibus lobulorum 3 vel 4; a *P. pycnoclado* differt perianthiis 5-plicatis.

Migothang–Nayathang, 3300–3900 m (Jun. 1, 1960; no. 201679—type in herb. NICH; dupl. in TI).

Spruceanthus semirepandus (Nees) Verd. in Ann. Bryol. suppl. 4: 153 (1934).

Darjeeling, 2000–2200 m; Victoria Falls, Darjeeling, 1950 m; Happy Valley, Darjeeling); Tenzing Norkay Road–Birch Hill, 2000 m; Darjeeling–Senchal, 2150–2500 m; Senchal–Tiger Hill, 2400–2500 m; Takdah, 1600–1700 m; Gangtok, 1900 m; Batasi–Palmajua, 2300–2600 m; Palmajua–Rimbick, 2200–2300 m; Rimbick, 2200 m; Ramam, 2400 m; Sandakphu–Tonglu, 2800–3550 m; Tingling Bridge–Yoksam, 1000–1700 m; Yoksam, 1700 m; Bilbatay Bhanjang, 2200 m; Bilbatay Bhanjang–Hati Sar, 2200–3000 m; Hati Sar–Minchin Dhap, 2600–3000 m; Minchin Dhap–Mul Pokhari, 2400–2800 m; Helok–Baroya Khimty, 1400–2400 m; Baroya Khimty–Thakma Khola, 2500–3000 m; Walunchung Gola–Zongi, 2700–3800 m; Yamphodin–Ghatte, 1600–2100 m; Birwa–Yektin, 1200–2500 m; Batasay–Bhuspate Danra, 2300–2600 m; Akasay, 1100–2300 m; Bhuspate Danra, 2600 m.

Distr. Eastern Himalaya, Khasia, Ceylon, Malaysia, extending to Borneo and Philippines, China, Formosa, and Japan.

This species may be one of the most frequent, next to *Ptychanthus striatus*, in this area. In Japan it is commonly distributed along the southwestern flank, and seems to be a representative of warm-temperate to subtropic Asian Lejeuneas. In our area it occurs below 3000 m alt. and is frequent between 1500–2500 m.

Trocholejeunea infuscata (Mitt.) Verd. in Ann. Bryol. suppl. **4**: 190 (1934)–*Homalolejeunea Levieri* Steph. ex Schiffn. (1899)–*T. Levieri* (Steph.) Verd.

Darjeeling, 2000–2200 m (Apr. 2, 1960); Darjeeling–Senchal, 2150–2500 m (Apr. 15, 1960); Senchal–Tiger Hill, 2400–2500 m (Apr. 16, 1960); Takdah, 1600–1700 m (Apr. 18, 1960); Lopchu, 1500 m (Apr. 28, 1960); Palmajua–Rimbick, 2000–2300 m (May 5, 1960); Phalut, 3550 m (May 10, 1960); Pamianchi–Gayzing Bazar, 1550–2000 m (May 13, 1960); Yoksam, 1700 m (May 17, 1960); Yoksam–below Bakkim, 1700–2200 m (May 18, 1960); Rayang, 2500 m (May 20, 1960); Bilbatay Bhanjang, 2200 m (Oct. 25 & 26, 1963); Bilbatay Bhanjang–Hati Sar, 2200–3000 m (Oct. 27, 1963); Minchin Dhap–Mul Pokhari, 2400–2800 m (Oct. 29, 1963); Taplejung–Garhi Danra, 1700–2000 m (Nov. 3, 1963); Iladanda–Helok, 1500–1900 m (Nov. 13, 1963); Birwa–Yektin, 1200–2500 m (Nov. 28, 1963); Batasay–Bhuspate Danra, 2300–2600 m (Dec. 1, 1963); Bhuspate Danra–Mai Majuwa, 1600–2900 m (Dec. 3, 1963).

Distr. E. Himalaya, Khasia, Ceylon, Burma, and S. W. China. Common in this area at elevations between 1500–2500 m.

Trocholejeunea sandvicensis (Gott.) Mizut. in Journ. Hattori Bot. Lab. **27**: 31 (1964)–*Phragmicoma sandvicensis* Gott. (1857)–*Brachiolejeunea sandvicensis* (Gott.) Evs.

Yoksam, 1700 m (May 17, 1960; nos. 201270; 201276).

Distr. Widely distributed in warm-temperate to tropic regions of Asia and Pacific islands, extending to New Caledonia.

This species is very common in southwestern Japan, extending northwards to Tohoku district, but in this area it seems to be rare, replaced by *Trocholejeunea infuscata* (Mitt.) Verd. which is never seen in Japan.

Subfam Cololejeuneoideae

Cololejeunea minutissima (Smith) Schiffn. in Pfl.-fam. I, **3**: 122 (1895).

Garibans–Tonglu, 3000–2800 m (Jun. 7, 1960; no. 200069).

Distr. China, Japan and other regions of Asia, Europe, Africa, and N. America.

The above-cited material belongs to a form previously described by Herzog (1930) as *Physocolea orbiculata* which I think a local race of the present species, and Schuster (1955) includes this form in subsp. *myriocarpa* (Nees et Mont.) Schust.

Cololejeunea producta (Mitt.) Hattori, comb. nov.–*Lejeunea producta* Mitt. in Journ. Linn. Soc. **5**: 117 (1861).

Phalut–Chia Bhanjang, 3100–3550 m (May 11, 1960; no. 200054).

Distr. Sikkim, and Bengal.

Cololejeunea (Taeniolejeunea) **pseudofloccosa** (Horik.) Benedix in Fedde, Repert. Beih. **134**: 62 (1953).

Takdah, 1600–1700 m (Apr. 18, 1960; no. 200164); Yoksam–below Bakkim, 1700–2200 m (May 18, 1960; no. 200106).

Distr. Sikkim, Java, Borneo, Sumatra, Formosa, and Japan. New to Himalaya.

Cololejeunea spinosa (Horik.) Hatt. in Bull. Sci. Mus. Tokyo **11**: 120 (1944)–*Physocolea spinosa* Horik. in Journ. Sci. Hiroshima Univ. ser. b, div. 2, **1**: 70 (1931)–

Cololejeunea indica Pande & Misra in Journ. Ind. Bot. Soc. **22**: 166 (1943).

Takdah, 1600–1700 m (Apr. 18, 1960; no. 200138).

Distr. E. Himalaya, Japan (excl. Hokkaido) to Ryukyu Is.

Indonesian *Cololejeunea planiflora* Benedix is closely related to the present species. In the original description Benedix (1953) cited a Himalayan material and, as a synonym, *Cololejeunea indica* Pande & Misra msc., but the Himalayan material does not seem to belong to *C. planiflora.*

PALLAVICINIACEAE

Calycularia crispula Mitt. in Journ. Linn. Soc. **5**: 122 (1861).

Jongri, 4000 m (May 22, 1960); Migothang, 3900 m (May 31, 1960); Phalut, 3550 m (Jun. 5, 1960); Sandakphu–Tonglu, 2800–3550 m (Jun. 7, 1960); Birwa–Yektin, 1200–2500 m (Nov. 28, 1963).

Distr. Himalaya, Korea, and Japan.

Formosan *Calycularia formosana* Horikawa (1934) seems to be conspecific with this species. One or two species described from India and still remaining little known also may be identical to this species.

PELLIACEAE

Pellia Neesiana (Gott.) Limpr. in Cohn, Krypt. Fl. Schles. **1**: 329 (1876).

Sandakphu–Tonglu, 2800–3550 m (Jun. 7, 1960; nos. 200993, 200996).

Distr. Himalaya, China, Korea, Japan, Siberia, Europe, and N. America.

METZGERIACEAE

Apometzgeria pubescens (Schrank) Kuwahara in Journ. Hattori Bot. Lab. **28**: 292 (1965)–*Jungermannia pubescens* Schrank, Prim. Fl. Schles. 231 (1792).

Phalut, 3550 m (May 11, 1960); Walunchung Gola–Zongi, 2700–3800 m (Nov. 11, 1963).

Distr. sp. India, China, Formosa, Borneo, Korea, Japan, Saghalin, and other temperate regions of Asia, Europe, and N. America (incl. Aleutians).

var. **kinabaluensis** Kuwahara in Journ. Hattori Bot. Lab. **28**: 166 & 292 (1965).

Phalut–Dentam, 1450–3630 m (May 11, 1960).

Distr. var. E. Himalaya, and Borneo.

Metzgeria conjugata Lindb. subsp. **japonica** (Hatt.) Kuwahara in Journ. Hattori Bot. Lab. **20**: 135 (1958); **28**: 293 (1965).

Migothang–Nayathang, 3300–3900 m (Jun. 1, 1960).

Distr. subsp. East Africa, Madagascar, Himalaya, Malaysia, Philippines, Formosa, Japan, Korea, and Saghalin.

Subsp. *conjugata* is widely distributed in the boreal to temperate regions of the Northern Hemisphere.

Metzgeria consanguinea Schiffn. in Nova Act. Acad. Caes. Leop.-Carol. **60**: 271 (1893)–*Metzgeria fruticulosa* auct. non (Dicks.) Evans; quoad plant. Asia.

Jongri, 4000 m (May 21, 1960); Migothang–Nayathang, 3300–3900 m (Jun. 1, 1960); Nayathang–Phalut, 3300–3500 m (Jun. 2, 1960).

Distr. E. Himalaya, Java, Korea, and Japan.

Metzgeria decipiens (Mass.) Schiffn. et Gott., Forschungreise " Gazelle " **4**: 43 (1890).

Walunchung Gola–Zongi, 2700–3800 m (Nov. 11, 1963; no. 236494).

Distr. E. Himalaya, Borneo, Japan, Hawaii, New Caledonia, New Zealand, Australia, Tasmania, Falkland Is., Juan Fernandez Is., and Chile.

Metzgeria hamata Lindb. in Acta Soc. Fauna Fl. Fenn. **1**: 25 (1877).

Senchal, 2400 m (Apr. 16, 1960); Senchal–Tiger Hill, 2500 m (Apr. 16, 1960); Phalut–Dentam, 1450–3630 m (May 11, 1960); Yoksam–below Bakkim, 2200 m (May 18, 1960); Migothang–Nayathang, 3300–3900 m (Jun. 1, 1960); Sandakphu–Tonglu, 2800–3550 m (Jun. 7, 1960); Taplejung, 1700 m (Nov. 1 & 2, 1963); Helok–Baroya Khimty, 1500–2500 m (Nov. 15, 1963); Baroya Khimty–Thakma Khola, 2500–3000 m (Nov. 16, 1963); Thakma Khola–Yamphodin, 2100–3300 m (Nov. 17, 1963).

Distr. Widely distributed in Asia, Pacific islands, New Zealand, Australia, N. & S. America, Europe, and S. Africa.

Metzgeria Harae Kuwahara in Journ. Hattori Bot. Lab. **28**: 296, f. 1 h–n (1965).

Walunchung Gola–Zongi, 2700–3800 m (Nov. 11, 1963; no. 236481—type).

Distr. Endemic.

Metzgeria mauina Steph., Sp. Hepat. **6**: 55 (1917).

Senchal–Tiger Hill, 2500 m (Apr. 16, 1960; no. 201058).

Distr. E. Himalaya, and New Caledonia.

Metzgeria molokaiensis Kuwahara in Journ. Hattori Bot. Lab. **23**: 20 (1960); **28**: 296 (1965).

Migothang–Nayathang, 3300–3900 m (Jun. 1, 1960); Walunchung Gola–Zongi, 2600–3800 m (Nov. 11, 1963).

Distr. Nepal, Sikkim, North Borneo, and Hawaii.

MARCHANTIACEAE

Dumortiera hirsuta (Sw.) Reinw., Blume et Nees.

var. **nepalensis** (Tayl.) Frye et Clark in Univ., Washing. Publ. Biol. **6**: 93 (1937).

Tiger Hill, 2500 m (Apr. 16, 1960); Iladanda–Selap, 1800–2600 m (Nov. 9, 1963).

Distr. India, Malaysia, Philippines, China, Japan, Hawaii, N. & S. America, and Samoa.

Marchantia paleacea Bertol., Opus Sci. Bologna **1**: 242 (1817).

Ghum–Senchal, 2250 m (Apr. 4, 1960); Kurseong, 1550 m (Apr. 12, 1960); Takdah, 1600–1700 m (Apr. 18, 1960); Gangtok, 1900 m (Jun. 13, 1960); Taplejung, 1700 m (Nov. 2, 1963).

Distr. Himalaya, Darjeeling, Assam, Nilghiri, China (Yunnan, Szechuan), Japan, Europe, Azores, N. America, Guatemala, Africa, ?Java, ?Sumatra, ?Hawaii, ?New Zealand, ?Samoa, ?Tahiti, and ?Fiji.

This species includes many synonyms; among others *Marchantia nepalensis* Lehm. et Lindenb. and *M. nitida* Lehm. et Lindenb. are familiar to old floras of Asia.

Marchantia papulosa Amakawa, sp. nov.

Minor, dichotoma, viridi-grisea, crassa et dura; frons ad 3 cm longa, 3–4 mm lata; costa parum producta, sensim in alas crassas excurrens, cellulis magnis muciferibus et cellulis sclerenchymaticis dispersis; stomata prominentia, 7 cel-

lulas alta ore interno stellato, 5–7 cellulis planis, in medio abrupte convexis circumdato; appendicula squamarum lanceolata, apice setaceo, purpurascens; capitula feminea parva, hemisphaerica, valde papulosa, 4–5-lobata, lobis brevissime bifidis; involucra inter lobos inserta; pedunculus 1 cm longus. Proxima est *Marchantiae griseae* Burgeff.

Senchal–Ghum, 2200–2400 m (Apr. 6, 1960); Takdah, 1600–1700 m (Apr. 18, 1960); Gangtok, 1900 m (Jun. 13, 1960, no. 201748—type in herb. NICH; dupl. in TI).

Marchantia Togashii Amakawa, sp. nov.

Mediocris, tenuis, viridi-olivacea vel -fusca; frons ad 3 cm longa, 0.5–1 cm lata; costa bene producta, abrupte in alas tenues excurrens, cellulis sclerenchymaticis nullis; stomata prominentia, ore interno subquadrato, 4 cellulis subconicis circumdato; squamae ventrales magnae, 2(–4)-seriatae, appendiculis suquamarum ovatis vel cordatis, apice obtuso vel subacuto, marginibus crenulatis; capitula feminea disciformia, centro convexo, conico-pustulato, sinuatim 9-lobata, lobis rotundatis, brevissimis, sinu humillima; involucra inter lobos inserta; pedunculus ad 7 mm longus.

Lopchu, 1500 m (Apr. 20, 1960, no. 201769—type in herb. NICH ; dupl. in TI).

REBOULIACEAE

Plagiochasma appendiculatum Lehm. et Lindenb. in Lehm., Pugillus **4**: 14 (1832).

Yoksam, 1700 m (May 17, 1960); Khebang-below Siling Tzokupa (Nov. 20, 1963).

Distr. Punjab, Himalaya, Bengal, S. India, China (Szechuan), and ?Manila.

CONOCEPHALACEAE

Wiesnerella denudata (Mitt.) Steph., Sp. Hepat. **1**: 154 (1899).

Senchal–Tiger Hill, 2400–2500 m (Apr. 16, 1960); Hati Sar–Minchin Dhap, 2600–3000 m (Oct. 28, 1963); W. Sikkim, lacking locality, 2200–2400 m (no. 237948).

Distr. Punjab Plain, E. Himalaya, Sumatra, Java, Formosa, Korea, Japan, and Hawaii.

TARGIONIACEAE

Targionia hypophylla L., Sp. Pl., ed. 1, 1136 (1753).

Victoria Falls, Darjeeling, 1950 m (Apr. 3, 1960).

Distr. Sikkim, India, China, Formosa, Korea, Japan, Madagascar, Tenerifa, Medeira, Canaries, Europe (preferably Mediterranean), N. & S. America, New Zealand, Australia, and Tasmania.

RICCIACEAE

Riccia fluitans L., Sp. Pl. ed. 1, 1139 (1753).

Mul Pokhari–Dumhan, 1400 m (Oct. 30, 1963).

Distr. Cosmopolitan.

MUSCI (compiled by Akira Noguchi)

SPHAGNACEAE* (by Hyoji Suzuki)

Sphagnum capillaceum (Weiss) Schrank, Baier. Fl. **2**: 435 (1789).

Sph. acutifolium Ehrh. in Brid. Journ. Bot. Schrad. **1800** (1): 271 (1801).

Sikkim: Migothang–Nayathang, 3900–3300 m (no. 200550 p.p. associated with *Sph. Girgensohnii*, Jun. 1, 1960).

Distr. Europe, Himalaya (Sikkim), China (Inner Mongolia, Kirin, Liaoning, Hupei), Japan (Shikoku, Honshu, Hokkaido), Saghalin, Kamchatka, Siberia, and N. & S. America.

Several plants were sorted out from a mass of *Sph. Girgensohnii*, from which they could easily be separated by reddish pigmentation and triangular stem-leaves with narrowly truncated apices.

Sphagnum cuspidatulum C. Müller in Linnaea **38**: 549 (1874). [Fig. 30]

Darjeeling: Sandakphu–Tonglu, 2600–3550 m (nos. 200545, 200546, 200549, last two associated with *Sph. Junghuhnianum* ssp. *pseudomolle*, Jun. 7, 1960); Hati Sar–Minchin Dhap, 2600–3000 m (no. 236060 p.p. associated with *Sph. Junghuhnianum* ssp. *pseudomolle*, Oct. 28, 1963); East Nepal: Diorali Bhanjang, 3500 m (no. 236610, Nov. 14, 1963); Helok–Baroya Khimty, 1500–2500 m (no. 236622, Nov. 15, 1963); Baroya Khimty–Thakma Khola, 2500–3000 m (no. 236686, Nov. 16, 1963); Yamphodin–Ghatte, 1600–2100 m (no. 236968, 236969, Nov. 18, 1963); Baroya Khimty–Yamphodin, 2100–3300 m (no. 237600, Nov. 16 & 17, 1963); Dhankuta–Chitray, 1200–2300 m (no. 237604, Oct. 24, 1963).

Distr. Himalaya (E. Nepal, Sikkim, Darjeeling), India (Khasia, Tanfla), Burma, Thai, Laos, Sumatra (var. *malaccense*), Celebes, Borneo, Philippines, and China (Yunnan). New to East Nepal.

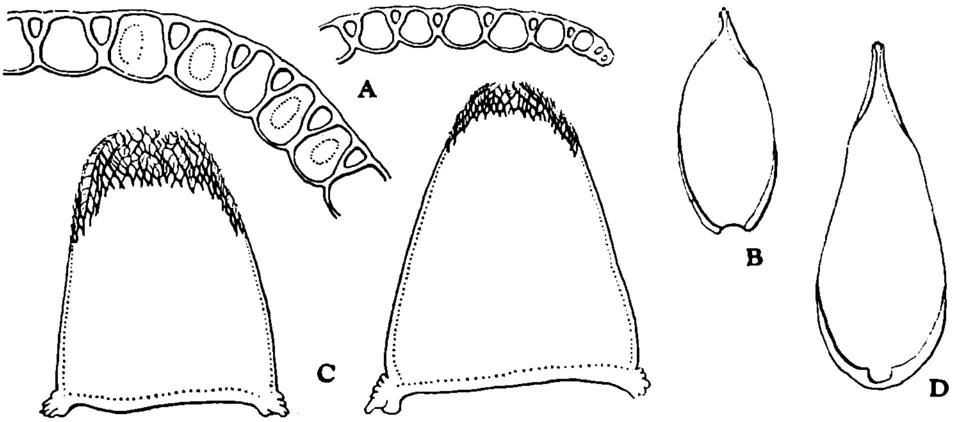

Fig. 30. *Sphagnum cuspidatulum* C. Müller
A. Cross-sections of branch-leaf, ×520. B. Pendent branch-leaf, ×28. C. Stem-leaves, ×28. D. Branch-leaf, ×28.

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* Contributions from Phytotaxonomical & Geobotanical Laboratory, Hiroshima University, N. Ser. No. 115.

Best recognized macroscopically by the recurved tips of the branch-leaves in dried condition and by the sharply five-angled branches in wet condition. Microscopically, the stem-leaf with lacerated apex and narrow borders, as well as the shape of chlorophyll-cells of branch-leaves in section are distincitive characteristics of this plant. Variations of laceration at the apices of stem-leaves are observed. The species is distributed in tropical Asia as wide as *Sph. Junghuhnianum.*

Sphagnum Girgensohnii Russow, Beit. Torfm. 46 (1865).

Sikkim: Migothang–Nayathang, 3900–3300 m (nos. 200550 associated with *Sph. capillaceum,* & 200551, Jun. 1, 1960). East Nepal: Taplejung, 1700 m (no. 236160, Nov. 2, 1963).

Distr. Europe, Caucasus, Himalaya (E. Nepal, Sikkim), China (Inner Mongolia, Heilungkiang, Szechuan, Yunnan), Java, Formosa, Korea, Japan, Siberia, Saghalin, Kamchatka, and N. America. New addition to the flora of East Nepal.

By the lacerate broad apex of stem-leaf, this species can easily be distinguished from allied species. A characteristic feature that the rounded apical pores on the outer surface fall on the pores on the inner surface in the upper part of branch-leaves is observed also in materials from Himalaya. This feature may be a very useful characteristic to determine this species in plants with isophyllous stem-leaves.

Sphangum imbricatum Hornsh.; Russow, Beitr. Torfm. 21 (1865).

Sikkim: Jongri, 4000 m (nos. 200547 & 200548, both associated with *Sph. squarrosum* & *Sph. subsecundum,* May 20, 1960); Gamothang, 3900 m (nos. 201655 & 201656, May 29, 1960).

Distr. Europe, Caucasus, Siberia, Himalaya (Sikkim), Korea, Japan (Honshu, Hokkaido), and N. & C. America. New to Himalaya (Sikkim).

This species is most easily recognized of all species by the presence of fringe-fibrils on the lateral sides of the hyaline-cells.

Sphagnum Junghuhnianum Dozy et Molkenboer

subsp. **pseudomolle** (Warnst.) H. Suzuki in Jap. Journ. Bot. **15**: 194 (1956).

S. Junghuhnianum var. *pseudomolle* (Warnst.) Warnst. in Pfl.-reich. **51**: 117 (1911).

E. Nepal: Hati Sar–Minchin Dhap, 2600–3000 m (nos. 235992, 236051, 236053, 236060 asociated with *Sph. cuspidatulum,* 236080 c.f., 236081 c. f., Oct. 28, 1963; no 237712, Oct. 28, 1963), Taplejung (no. 236129, Nov. 1, 1963); Tharpu, 1200 m (no. 237148, Nov. 26, 1963); near Chyangthaphu–Birwa, 1100–2100 m (no. 237153, Nov. 27, 1963); Akasay, 1100–2300 m (no. 237262, Nov. 30, 1963); Batasay–Bhuspate Danra, 2300–2600 m (nos. 237273, 237276, 237285, 237308–237312, 237314, 237318, 237327, Dec. 1, 1963); Bhuspate Danra, 2600 m (nos. 237355, 237388, 237393, 237397, 237400, Dec. 2, 1963); Bhuspate Danra–Mai Majuwa, 1600–2900 m (no. 237435, Dec. 3, 1963).

Distr. Himalaya (E. Nepal, Sikkim, Darjeeling), Thai, Sumatra, Philippines, China (Chekiang, Szechuan, Kweichow, Yunnan), Formosa, and Japan (Kyushu, Shikoku, Honshu). New to East Nepal.

In a paper dealt with *Sph. Junghuhnianum* (1956), I have proposed to divide the species into subsp. *pseudomolle* and subsp. *Junghuhnianum* based on the different feature of perforation in stem-leaves, and expected that they might have different ranges, i. e. the one in the north and the other in the south. In fact, all the specimens, so far I could examined from East Himalaya, Thailand, Sumatra, Formosa and Japan are identified as subsp. *pseudomolle*, and only the material from North Borneo is attributed to subsp. *Junghuhnianum*. Johnson (1960) has recognized only subsp. *Junghuhnianum* from Philippines, Malaya and Indonesia. On the other hand, Chen & Lee (1956) have var. *typicum* (roughly corresponding to subsp. *Junghuhnianum*) from also China (Kiangsi, Fukien, Formosa, Kweichow, Yunnan and Kwangtung). Since they have, in this case, separated into two varieties based on shape partition and fibers of stem-leaves, Chinese material should be redetermined according to perforation of stem-leaves for further discussion about the distribution of this species. However, the occurrence of subsp. *pseudomolle* on the equator in Central Sumatra suggests that the range of two subspecies mentioned above not so simple as it was anticipated by myself.

Sphagnum khasianum Mitten in Journ. Linn. Soc. Suppl. **1**: 156 (1859). [Fig. 31]

Darjeeling: Senchal–Tiger Hill, 2500 m (nos. 200538–200544, Apr. 16, 1960); Takdah, 1600–1700 m (no. 201401, Apr. 18, 1960).

Distr. Himalaya (Darjeeling), India (Khasia), Thai, and W. China (Szechuan, Yunnan). New to Himalaya (Darjeeling).

Judged from the current descriptions, *Sph. khasianum* is closely related to *Sph. ovatum* Hampe. In the shapes of branch-leaf and its apex, our specimens seem rather similar to *Sph. ovatum*, but a key characteristic of *Sph. ovatum*, i. e., scanty fibers on the outer surface of branch-leaves was not so clear in our specimens as

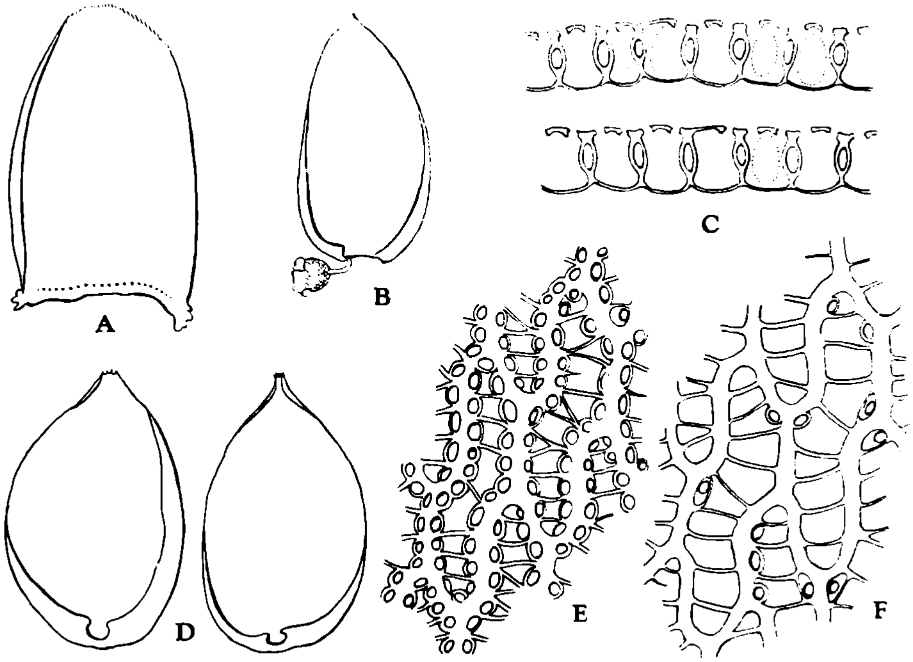

Fig. 31. *Sphagnum khasianum* Mitten

A. Stem-leaf, ×20. B. Antheridial leaf with dehisced antheridium, ×20. C. Cross-sections of branch-leaf, ×520. D. Branch-leaves, ×20. E. Cells on the outer surface in the upper middle portion of branch-leaf, ×520. F. Ditto on the inner surface, ×520.

to be attributed to *Sph. ovatum*. In addition, they so well coincide with a specimen of *Sph. khasianum* from Thailand (Hansen no. 11529), they have been identified as this species. Male sexual organ of this plant has been observed for the first time. Antheridial leaves are not differentiated, 0.96 mm long and 0.64 mm wide in an example. Antheridium is spherical with short stalk, ca. 0.20 mm in diameter, dehisces on its upper half.

Sphagnum nepalense H. Suzuki, sp. nov. (Acutifolia) [Fig. 32]

Planta innovans, deorsum saepius simplex vel subsimplex, sursum plerumque fasciculis ramorum, robusta, sursum fluva ad flavo-fusca, deorsum flavescens, (5–) 8–15 cm alta. Cylindrus lignosus pallidus, flavus ad fulvus, rarius fulvorubescens, incrassatus. Hyalodermis caulis stratis plerumque 2, saepe partim 1 vel 3, cellulis interioribus stratis minoribus, parietibus plus minusve incrassatis, exterioribus magnis, superficie quadrilateralibus, supermo parietibus tenuibus poriformibusque evolutis nonnunquam perforatis. Folia caulina potius magna, plerumqueelongato-ovata, insertione angusta, minute auriculata, concava, (1.48–) 1.57–1.66 (–1.77) mm longa, (0.64–) 0.74–0.83 (–0.92) mm lata ad basin, infra media 0.83–0.96 mm lata, apice anguste truncata dentataque, 4–7 dentibus, nonnunquam rotundato-truncata hyalino-limbataque, marginibus lateralibus anguste limbatis, limbis 2–4 (–5) seriebus cellularum angustissimarum formatis, basin versus haud dilatatis. Cellulae hyalinae fibrosae porosaeque, praesertim vermiculatae, prope apicem folii rhomboideae 7–8-plo longiores quam latiores, deorsum latiores et ad medium folii 7–10-plo longiores quam latiores, ad basin folii 10–12-plo longiores quam latiores, prope marginibus lateralibus saepe uniseptatae, interiore superficie superiore dimidio folii poris rotundis magnis exannulatis ad lacunis membranaceis instructae, basin versus deminutis, ad basin haud porosae, exteriore superficie poris rotundis ellipticisve in angulis apicalibus lateralibusque cellularum, nonnunquam praeterea ad commussuralibus despositae. Rami in fasciculo ad 3, quorum 2 rami patentes, attenuati arcuatique, ad (9–) 18 mm longi, rami penduli ad (5–) 9 mm longi, hyalodermide strato uno, cellulis retortiformibus cervicibus inconspicuis, plerumque 2 in serie positis. Folia ramulina laxe imbricata, siccitate nitidula, lanceolata, rarius falcatula, concava, (2.04–) 2.37–2.75 mm longa et (0.95–) 1.09–1.28 mm lata, apice anguste truncata dentataque, 5–7 dentibus, marginibus superne valide incurvatis, integris, siccitate plus minusve undulatis, anguste limbata, limbis e 2 seriebus cellularum angustissimarum compositis. Cellulae hyalinae multifibrosae, vermiculatae, ad medium 10–13-plo longiores quam latiores, sursum minores tum 6–8-plo longiores quam latiores, deorsum majores et ad basin folii 13–15-plo longiores quam latiores, interiore folii superficie pauciporosae, plus minusve porosae tantum prope marginibus lateralibus, poris rotundis ellipticisve tenuiter annulatis ad commissuras, saepe sursum in angulis lateralibus cellularum pseudoporis instructae, exteriore superficie poris permultis ellipticis, bene annulatis ad commissuras in dense seriebus dispositae, versus basin folii in numero deminuentibus. Folia ramulina pendula ut in folio ramuli patentia, sed interiore superfice in latiorem spatium porosae, exteriore superficie poris rotundis exannulatis in quoque parietibus dispositae. Cellulae chlorophylliferae sectione transversali plerumque trapezoideae, cum pariete

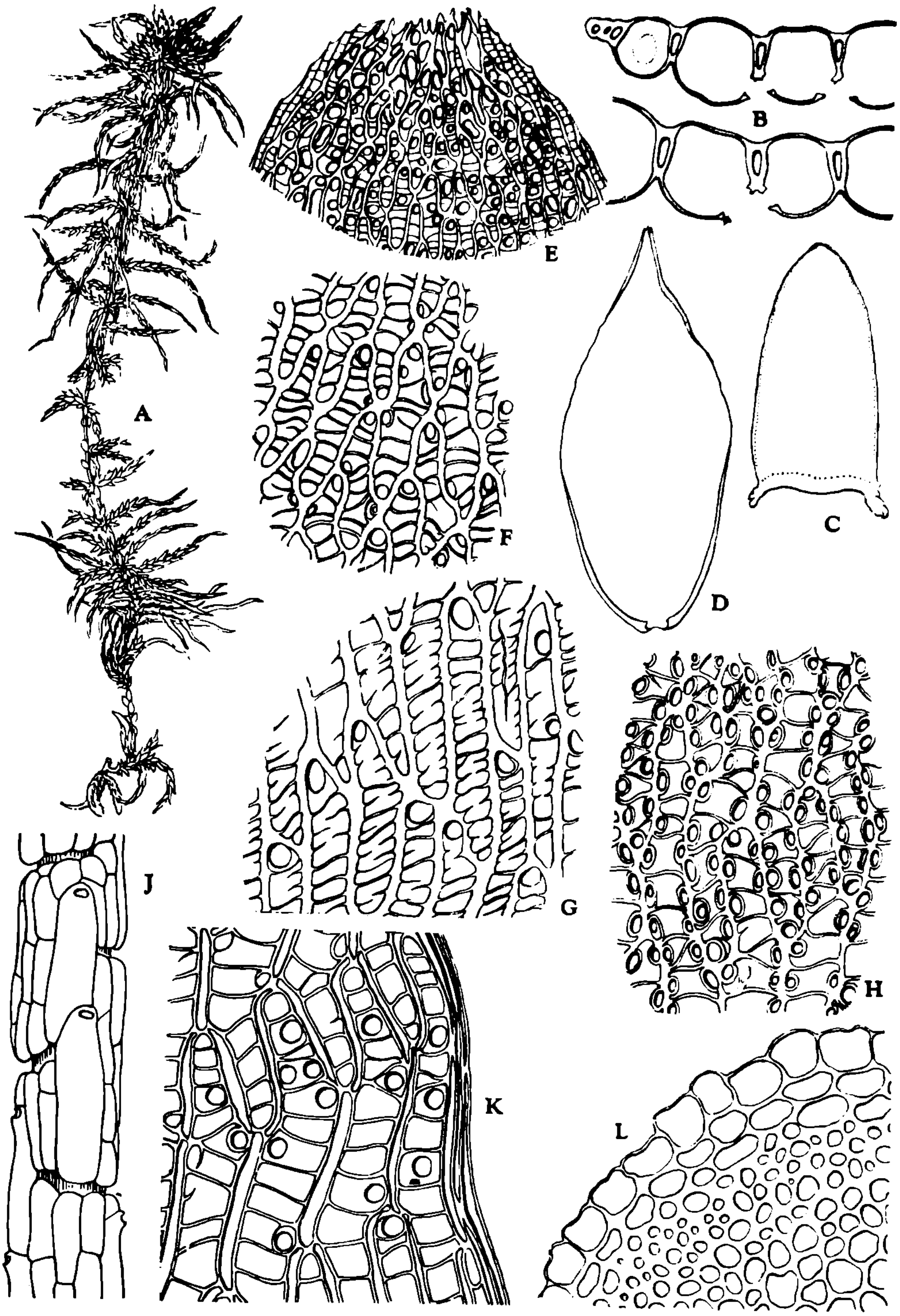

Fig. 32. *Sphagnum nepalense* H. Suzuki
A. Sterile plant, × 1. B. Cross-sections of branch-leaf, × 520. C. Stem-leaf, × 21. D. Branch-leaf, × 21. E. Perforation on the inner surface in the apical part of stemleaf, × 117. F. Outer surface of upper part of ditto, × 520. G. Outer surface near the base of ditto, × 520. H. Outer surface of the central portion of branch leaf, × 520. J. Part of denuded branch, × 60. K. Inner surface of marginal portion of branch-leaf. L. Cross-section of stem, × 240.

exteriore longiore dorso foliorum sitae, utrinque liberae. Cetera ignota.

E. Nepal: Mai Majuwa-Dhara Pani, 1500–1900 m (H. Hara, H. Kanai, S. Kurosawa, M. Togashi, & T. Tuyama, no. 237569, Dec. 4, 1963—holotype in NICH, dupl. in TI).

Distr. Endemic to East Nepal.

Elongated chlorophyll-cells and strongly ringed pores arranged in more or less continuous rows along the commissures of branch-leaves make us think of belonging of this species to Subsecunda group, but the cortical cells with thin walls and shapes of both branch-leaf and its chlorophyll-cells in section maintain that species should be situated in Acutifolia.

I believe that the species may be closely allied to *Sph. ceylanicum* (Acutifolia), but is distinguished from the latter mainly by stronger perforation on the inner surfaces of both stem- and branch-leaves.

Sphagnum palustre L., Sp. Pl. ed 1, 1106 (1753).

Sph. cymbifolim Ehrh.: Hedw., Fundam. **2**: 86 (1782)

Sikkim: Senchal, 2200–2400 m (no. 237949, Apr. 2, 1963).

Distr. Europe, Australia (?), Caucasus, Himalaya (E. Nepal, Sikkim, Bhutan), India (Assam), Thai, China, Philippines, Formosa, Ryukyu, Japan, Saghalin, and N. & S. America.

A specimen has been identified as this species by the broad triangular chlorophyllose leaf-cells in section.

Sphagnum squarrosum Crom, Samml. Deuts. Laubm. 24 (1803).

Sikkim: Jongri, 4000 m (nos. 200547 & 200548, both associated with *Sph. imbricatum* & *Sph. subsecundum*, May 20, 1960).

Distr. Europe, China, Korea, Japan, Saghalin, Kuriles, and N. Ameriea.

Easily recognized even in the field by its squarrose branch-leaves, microscopically by lingulate stem-leaves with loose areolation.

Sphagnum subsecundum Nees: Sturm, Deuts. Fl. Crypt. **17**: pl. 3 (1819).

Sikkim: Jongri, 4000 m (nos. 200547, 200548, both associated with *Sph. imbricatum* & *Sph. squarrosum*, May 20, 1960).

Distr. Europe, Caucasus, Siberia, W. China (Yunnan), Burma, Thai, New Guinea, Korea (Quelpaert), Japan (Honshu, Hokkaido), Kamchatka, North America, and New Zealand.

By the tapering branch-leaf and anisophyllous stem-leaf, the species is seperated from *Sph. khasianum*, though having also strongly ringed pores arranged like the strings of beads on the outer surface of the branch-leaf.

POLYTRICHACEAE (by Takemasa Osada)

Atrichum undulatum (L.) Pal. de Beauv. var. **Haussknechtii** (Jur. et Milde) Frye, Moss Fl. N. Amer. **1** (2): 103 (1937).

E. Nepal: Zongi-Iladanda, 1800–2700 m.

Distr. Northern Hemisphere.

Lyellia crispa R. Brown in Trans. Linn. Soc. **12** (2): 562 (1819).

Darjeeling: Senchal Rest House–Ghum, 2400–2200 m (det. Z. Iwatsuki); Darjeeling, Happy Valley. Sikkim: Yoksam, 1700 m. Nepal: Bilbatay Bhanjang, 2200 m; Ghatte-Khebang, 1600–2200 m; Bhuspate Danra-Mai Majuwa, 1600–2900 m; Mai

Pokhari, 1500–1900 m.

Distr. Himalaya, and W. China (Yunnan).

Oligotrichum semilamellatum (Hook. f.) Mitt. in Journ. Linn. Soc. Suppl. **1**: 150 (1859).

Darjeeling: Senchal-Tiger Hill, 2500 m; Sandakphu–Tonglu, 2600–3550 m. Nepal: below Siling Tzokupa–Siling Tzokupa, 2000–3000 m.

Distr. Himalaya, and Java.

Pogonatum akitense Besch. in Ann. Sci. Nat. Bot. **17**: 354 (1893).

Darjeeling: Birch Hill, 2000 m.

Distr. Himalaya, China, Korea, and Japan.

Pogonatum cf. **aloides** (Hedw.) Pal. de Beauv., Prodr. 84 (1805).

Sikkim: Gangtok, 1650 m.

Distr. Europe, and Asia.

Pogonatum alpinum (Hedw.) Roehl. in Ann. Wett. Gesell. **3**: 226 (1812).

Darjeeling: Phalut, 3550 m.

Distr. Cosmopolitan.

Pogonatum fastigiatum Mitt. in Journ. Linn. Soc. Suppl. **1**: 154 (1859).

Nepal: Baroya Khimty–Thakma Khola, 2500–3000 m; Yamphodin–Ghatte, 1600–2100 m.

Distr. Himalaya.

Pogonatum Junghuhnianum (Doz. et Molk.) Doz. et Molk., Bryol. Jav. **1**: 41 (1855).

Sikkim: Lower Road, Rabong La–Temi, 1000–1300 m. Nepal: Bilbatay Bhanjang–Hati Sar, 2200–3000 m; Bhuspate Danra–Mai Majuwa, 1600–2900 m.

Distr. Sikkim, Indonesia, Philippines, and Formosa.

var. **incurvum** (Doz. et Molk.) Doz. et Molk., Bryol. Jav. **1**: 42 (1855).

Darjeeling: Victoria Fall, 1950 m. Sikkim: Gangtok, 1750 m; Yoksam, 1770 m.

Distr. var. Himalaya, and Indonesia.

Pogonatum microstomum (R. Br.) Brid., Bryol. Univ. **2**: 745 (1827).

Darjeeling: Phalut–Dentam, 3550–1450 m; Sandakphu–Tonglu, 3550–2600 m; Darjeeling–Tiger Hill, 2500 m. Nepal: Bilbatay Bhanjang, 2200 m; Bilbatay Bhanjang–Hati Sar, 2200–3000 m; Hati Sar–Minchin Dhap, 2600–3000 m; Iladanda–Selap, 1800–2600 m; Selap–Walunchung Gola, 2600–3200 m; Walunchung Gola–Zongi (2700–3800 m); Zongi–Iladanda, 1800–2700 m; Iladanda–Helok, 1500–1900 m; Yamphodin–Ghatte, 1600–2100 m; near Chyangthaphu–Birwa, 1100–2100 m; Batasay–Bhuspate Danra, 2300–2600 m.

Distr. Ceylon, Himalaya, W. China (Szechuan, Yunnan), Philippines, and Formosa.

Pogonatum muticum Broth. in Sitzungsberichte Akad. Wiss. Wien 1, **133**: 583 (1924); in Symb. Sin. **4**: 136 (1929).

Nepal: Bilbatay Bhanjang, 2200 m; Bilbatay Bhanjang–Hati Sar, 2200–3000 m.

Distr. Nepal, and W. China (Yunnan).

Pogonatum perichaetiale (Mont.) Jaeg., Adumb. **1**: 719 (1873–74).

Darjeeling: Phalut, 3550 m; Sandakphu–Tonglu, 3550–2600 m. Nepal: Bilbatay Bhanjang, 2200 m; Selap–Walunchung Gola, 2600–3200 m; Walunchung Gola–Zongi, 2700–3800 m; Zongi–Iladanda, 1800–2700 m; Yamphodin–Ghatte, 1600–2100 m; below Siling Tzokupa–Siling Tzokupa, 2000–3000 m.

Distr. Himalaya, Nilghiri, and W. China (Szechuan).

Pogonatum proliferum (Griff.) Mitt. in Journ. Linn. Soc. Suppl. **1**: 152 (1859).

Darjeeling: Sandakphu-Tonglu, 3550-2600 m. Nepal: Yamphodin-Ghatte, 1600-2100 m.

Distr. E. Himalaya.

Pogonatum rufisetum (Wils.) Mitt. in Journ. Linn. Soc. Suppl. **1**: 153 (1859).

Darjeeling: Phalut, 3550 m; Sandakphu-Tonglu, 3550-2800 m; Bakkim-Jongri, 4000 m.

Distr. E. Himalaya (Sikkim).

Pogonatum tortipes (Wils.) Jaeg., Adumb. **1**: 719 (1873-74).

Sikkim: Migothang.

Distr. E. Himalaya (Sikkim), and China.

Pogonatum urnigerum (Hedw.) Pal. de Beauv., Prodr. 84 (1805).

Nepal: Taplejung, 1700 m; Yamphodin-Ghatte, 1600-2100 m; below Siling Tzokupa-Siling Tzokupa, 2000-3000 m.

Distr. Northern Hemisphere.

Polytrichum xanthopilum Mitt. in Journ. Linn. Soc. Suppl. **1**: 156 (1859).

Sikkim: Migothang-Nayathang, 3900-3300 m.

Distr. E. Himalaya (Sikkim).

FISSIDENTACEAE (by Akira Noguchi)

Fissidens anomalus Mont. in Ann. Sci. Nat. Bot. ser. 2, **17**: 252 (1842). (det. Norkett).

Nepal: below Siling Tzokupa-Khebang, 500-2000 m.

Distr. Himalaya, India, Ceylon, Indo-China, Yunnan, Philippines, and Indonesia.

Fissidens areolatus Griff. in Calcut. Journ. Nat. Hist. **2**: 506 (1842).

Darjeeling: Kurseong, 1550 m; Ramam; Tiger Hill, 2150-2800 m.

Distr. Himalaya, Burma, Thai, Sumatra, Philippines, China, Formosa, and Japan.

Fissidens ceylonensis Doz. et Molk. in Ann. Sci. Nat. Bot. ser. 3, **2**: 304 (1844). (det. Norkett).

Nepal: Dhara Pani-Dhankuta, 300-1200 m.

Distr. Himalaya, India, Thai, and Indonesia.

Fissidens cristatus Wils. ex Mitt. in Journ. Linn. Soc. Suppl. **1**: 137 (1859).

Nepal: Hati Sar-Michin Dhap, 2600-3000 m; Baroya Khimty-Thakma Khola, 2500-300 m (det. Norkett); Bhuspate Danra-Mai Majuwa, 1600-2900 m (det. Norkett).

Distr. Europe, Africa, and Asia.

Fissidens grandifrons Brid., Sp. Musc. **1**: 170 (1806).

Nepal: Iladanda-Selap, 2800-2600 m.

Distr. Africa, Himalaya, India, Siberia, China, Japan, and N. & C. America.

Fissidens involutus Wils. ex Mitt. in Journ. Linn. Soc. Suppl. **1**: 138 (1859). (det. Norkett).

Nepal: Baroya Khimty–Thakma Khola, 2500–3000 m.

Distr. Himalaya, India, Burma, Thai, and Vietnam.

Fissidens nobilis Griff. in Calcut. Journ. Nat. Hist. **2**: 505 (1842).

Darjeeling: Palmajua–Rimbick, 2300–2200 m.

Distr. Himalaya, India, Burma, Thai, Indonesia, W. China (Yunnan), and Philippines.

DITRICHACEAE (by Akira Noguchi)

Ceratodon purpureus Brid., Bryol. Univ. 480 (1826).

Darjeeling: Batasi, 2150 m; Phalut, 3550 m.

Distr. Cosmopolitan.

Ceratodon stenocarpus Bruch et Schimp., Müll. Syn. **1**: 647 (1849).

Nepal: Iladanda–Selap, 1800–2600 m, + *Anomobryum* sp.; Selap–Walunchung Gola, 2600–3200 m; Walunchung Gola–Zongi, 2700–3800 m; below Siling Tzokupa–Siling Tzokupa, 2000–3000 m.

Distr. Almost cosmopolitan.

DICRANACEAE (by Noriwo Takaki)

Aongstroemia orientalis Mitt. in Trans. Linn. Soc. ser. 2, **3**: 154 (1891).

Darjeeling: Phalut, 3550 m.

Distr. Sikkim, Bhutan, Burma, NW. Yunnan, Philippines, Formosa, Japan (var. *fuji-alpina*), and C. America.

This specimen agrees well with the type specimen in structural details. The species *Anomobryum fuji-alpinum* described by the author on the specimen collected at the summit of Mt. Fuji, Japan was revised afterwards (1962) by himself as *Aongstroemia orientalis* var. *fuji-alpina*. As was discussed by the author, the var. *fuji-alpina* differs from the type slightly in some features of leaves. It is interesting that Formosan specimens of *A. orientalis* reported by Noguchi (1944) show the intermediate form between the type and its var. *fuji-alpina* in these features. It is also interesting that this species is distributed disjunctively in both sides of the Pacific.

Brothera leana (Sull.) C. Muell., Gen. Musc. Fr. 259 (1900).

E. Nepal: Selap–Walunchung Gola, 2600–3200 m, +*Dicranodontium caespitosum*.

Distr. W. Himalaya, Nepal, Assam, S. India, W. China (Yunnan), Manchuria, Philippines, Japan, and N. America.

A small amount was found in the packet of *Dicranodontium caespitosum*. Sterile. Bearing numerous rudimentary leaves in the axils of the upper leaves.

Campylopus alpigena Broth.

var. **lamellatus** Broth. in Symb. Sin. **4**: 17 (1929).

Darjeeling: Senchal Rest House–Ghum, 2400–2200 m.

Distr. E. Himalaya, and NW. Yunnan. New to E. Himalaya.

Compared with the type specimen in H, collected by Handel-Mazzetti in NW. Yunnan (3150 m), they are alike in their important characters except that Darjeeling plants have longer leaf, narrow and hyaline marginal cells in the leaf base, and costa more lamellose on the back.

Campylopus atro-virens De Not., Syll. Musc. Ital. 221 (1838).

E. Nepal: Hati Sar–Minchin Dhap, 2600–3000 m.

Distr. Europe, E. Himalaya (Nepal), China, New Zealand, and N. America. New to India.

Campylopus introflexus (Hedw.) Brid., Mant. Musc. 72 (1819).

Sikkim: Yoksam, 1700 m.

Distr. Cosmopolitan.

Campylopus laetus (Mitt.) Jaeg. in Ber. Sci. Gall. Naturw. Ges. **1870–71**: 417, 172 (1872).

Nepal: near Chyangthaphu–Birwa, 1100–2100 m; Tuwa–Taplethok, 1300–1600 m; Taplethok–Helok, 1400–1600 m.

Distr. Nepal, Bengal, Khasia, Assam, and S. India.

In comparison with the type specimen in NY, collected by J. D. Hooker & Taylor in Khasia Mts., India, these present specimens seem to be referable to this species. Although this species is generally placed under the subgen. Palinocraspis, the costa of the type specimen is composed, in cross section, of well-developed stereid band below, and none or a very faint one above.

Campylopus latinervis (Mitt.) Jaeg. in Ber. Sci. Gall. Naturw. Ges. **1870–71**: 426 (1872).

E. Nepal: Yamphodin–Ghatte, 1600–2100 m. Darjeeling: Darjeeling, 2000–2200 m.

Distr. Nepal, Sikkim, S. India, and Ceylon.

The author has examined moreover the specimens of this species from Landaur of N. India and Ceylon which are preserved in TNS and B, respectively. On Landaur specimen, a note " almost characteristic on *Rhododendron arboreum* and *Pieris ovalifolia*, 6500–7500 ft." is seen. These Nepal and Darjeeling plants are also apparently corticolous.

Campylopus nilghiriensis (Mitt.) Jaeg. in Ber. Sci. Gall. Naturw. Ges. **1870–71**: 426 (1872).

Darjeeling: Phalut, 3550 m.

Distr. E. India.

This specimen agrees with the one labelled as *C. nilghiriensis* in the exsiccati of M. Fleisch., Musc. Frond. Archip. Ind. & Polyn. ser. 12, n. 558 (1933), which was collected in Nilghiri Mts., Assam.

Campylopus Richardii Brid., Mant. Musc. 73 (1819).

E. Nepal: Yamphodin–Ghatte, 1600–2100 m; Bilbatay Bhanjang, 2200 m; Bilbatay Bhanjang–Hati Sar, 2200–3000 m. Sikkim: Yoksam, 1700 m, c. fr.; Gangtok, 1750 m; Pamianchi, 2000 m. Darjeeling: Takdah, 1600–1700 m; Darjeeling, 2000–2200 m ; Victoria Fall, 1950 m; Rimbick, 2200 m, c. fr.; Senchal, 2400 m.

Distr. Cosmopolitan including W. Himalaya, Sikkim, Khasia, Bengal, Chhotangpur, S. India, Ceylon, Burma, Malay, Sumatra, Borneo, Celebes, Kwangsi, Fukien, Tahiti, Philippines, Formosa, and Japan.

This is apparently quite common in the present regions. Fruits are very rare; only 2 of 27 specimens are fertile.

Campylopus Schwarzii Schimp., Musc. Eur. Nov. Bryol. Eur. Suppl. fasc. 1–2, Campylop. **1**: 1 (1864).

E. Nepal: below Siling Tzokupa–Siling Tzokupa, 2000–3000 m, +*Oreoweisia laxifolia*; Walunchung Gola–Zongi, 2700–3800 m; Selap–Walunchung Gola, 2600–3200 m.

Darjeeling: Darjeeling, 2000–2200 m; Senchal, 2400 m; Phalut-Sandakphu, 3200–3550 m; Phalut, 3550 m +*Diaphanodon blandus*; Sandakphu-Tonglu, 2600–3550 m.

Distr. W. Europe, Alps, Scandinavia, Bukovina, Nepal, and Japan. New to Himalaya.

This seems to be one of the common mosses in the present regions. These Himalayan specimens agree well with European ones in their gametophytic features such as erect-patent, slightly secund leaves with well-differentiated alar cells, short lamina not reaching the middle of the leaf, long-excurrent entire subula, broad costa reaching about 2/3 the width of the leaf base, showing in cross section a row of large cells on ventral surface and a dorsal band of nearly homogeneous cells without stereid, etc. Unlike European materials which sporophytes are unknown, these Himalayan specimens bear many sporophytes which show the following characters: Seta 1–1.5 cm long, nearly straight when dry, more or less curved when moist. Capsules erect, oblong-cylindric, nearly symmetric, deeply furrowed when dry, urn 1.5–1.8 mm long, 0.5 mm thick, exothecial cells elongate, incrassate. Peristome teeth dark-reddish, linear from a lanceolate base, 0.35 mm long, 0.08 mm wide at base, divided 2/3 the way down, longitudinally striate below, papillose above, colorless at the tips, annulus lacking. Operculum long-conic, 1.2–1.4 mm long. Calyptra ciliate at base. Spore about 20 μ in diameter, finely papillose.

Campylopus subfragilis Ren. et Card. in Bull. Soc. Bot. Belg. **34** (2): 59 (1896).

E. Nepal: Bilbatay Bhanjang–Hati Sar, 2200–3000 m, +*Oreoweisia laxifolia*. Darjeeling: Darjeeling, 2000–2200 m; Victoria Fall, 1950 m.

Distr. Nepal, Sikkim, and S. India.

These specimens agree well with one labelled as *C. subfragilis*, which was collected in Palni Hills, S. India and presented to the author from Dr. H. C. Gangulee.

Campylopus subgracilis Ren. et Card. ex Gangulee in Bull. Bot. Soc. Beng. **14**: 26 (1960).

E. Nepal: Helok–Baroya Khimty, 1500–2500 m; Iladanda–Selap, 1800–2600 m; below Siling Tzokupa–Siling Tzokupa, 2000–3000 m.

Distr. Nepal, (Sikkim), and Burma.

These specimens agree well with one labelled as *C. subgracilis* which was collected in Darjeeling and is preserved in B.

Dicranella heteromalla (Hedw.) Schimp., Coroll. 13 (1856).

E. Nepal: Zongi–Iladanda, 1800–2700 m; Thakma Khola–Yamphodin, 2100–3300 m; Hati Sar–Minchin Dhap, 2600–3000 m; Walunchung Gola–Zongi, 2700–3800 m. Darjeeling: Batasi, 2150 m; Phalut, 3550 m; Sandakphu-Tonglu, 3550–2600 m.

Distr. Cosmopolitan including Europe, W. Himalaya, Nepal, Sikkim, Bhutan, Assam, Tibet, Caucasus, Amur, Japan, and N. America.

This seems to be a very common and abundant plant in the present regions. Fruits are found in all the 12 packets.

Dicranella setifera (Mitt.) Jaeg. in Ber. Sci. Gall. Naturw. Ges. **1870–71**: 376 (1872).

Sikkim: Lower Road, Rabong La-Temi, 1000–1300 m.

Distr. Sikkim, Bhutan, Assam, and Philippines.

Compared with the type specimen in NY, collected in Lachen, India, this species is characterized in having relatively robust habit, widely spreading and flexuose leaves when dry, and subglobose, asymmetric and strumose capsules.

Dicranella spiralis (Mitt.) Jaeg. in Ber. Sci. Gall. Naturw. Ges. **1877–78**: 374 (1880).

Darjeeling: Sandakphu-Tonglu 2800-3550 m.

Distr. E. Himalaya.

In comparative study, these specimens agree in their important characters with the type specimen in NY, collected by J. D. Hooker in Sikkim-Himalaya. So far as the author has been able to ascertain, the dry capsules of the type specimen are apparently furrowed and its striations on peristome are vertical, though Gangulee (1960) stated the former are almost smooth and the latter are spiral.

Dicranodontium asperulum (Mitt.) Broth. in Engl., Pfl.-fam. I, **3**: 336 (1901).

E. Nepal: Zongi–Iladanda, 1800–2700 m; Walunchung Gola–Zongi, 2700–3800 m, +*Oreoweisia laxifolia.*

Distr. Europe, Nepal, Sikkim, Naga Hills, Assam, Yunnan, Japan, Alaska, and Eastern N. America.

Compared with the type specimen in NY. Readily known by the leaf being apparently serrate on the margin of its broader part.

Dicranodontium caespitosum (Mitt.) Par., Ind. Bryol. 337 (1896).

E. Nepal: Selap–Walunchung Gola, 2600–3200 m, +*Symblepharis helicophylla*, +*Dicranodontium denudatum*, +*Brothera leana.* Sikkim: Jongri, 4000 & 4000–4200 m, Darjeeling: Phalut, 3550 m, +*Symblepharis helicophylla.*

Distr. W. Himalaya, Nepal, Sikkim, and Yunnan.

Compared with Indian specimen in TNS.

Dicranodontium denudatum (Brid.) Britt. in Williams, N. Amer. Fl. **15**: 151 (1913).

E. Nepal: Taplejung, 1700 m; Yamphodin–Ghatte, 1600–2100 m; Bhuspate Danra, 2600 m; Walunchung Gola–Zongi, 2700–3800 m. Sikkim: Pamianchi, 2000 m; Jongri, 4000 m, +*Oncophorus Wahlenbergii* & *Oreoweisia laxifolia.* Darjeeling: Senchal-Tiger Hill, 2500 m.

Distr. Europe, Caucasus, E. Himalaya, Siberia, Japan, and N. America. New to India.

Considerably variable in general habit. The indistinctness of the costa in the leaf base, which is considered to be one of the characteristics of this species, is also variable.

Dicranodontium dimorphum Mitt. in Ren. et Card. in Bull. Soc. Bot. Belg. **38** (1): 8 (1900).

Sikkim: Pamianchi, 2000 m; Jongri, 4000 m. Darjeeling: Senchal, 2400 m.

Distr. Sikkim, Bhutan, Assam, and Naga Hills.

Compared with the specimen in Mitten's herbarium in NY, which was collected in Sikkim-Himalaya and was referred to this species by Brotherus. The features mentioned by Gangulee (1960) in this species " inner basal lamina cells more or

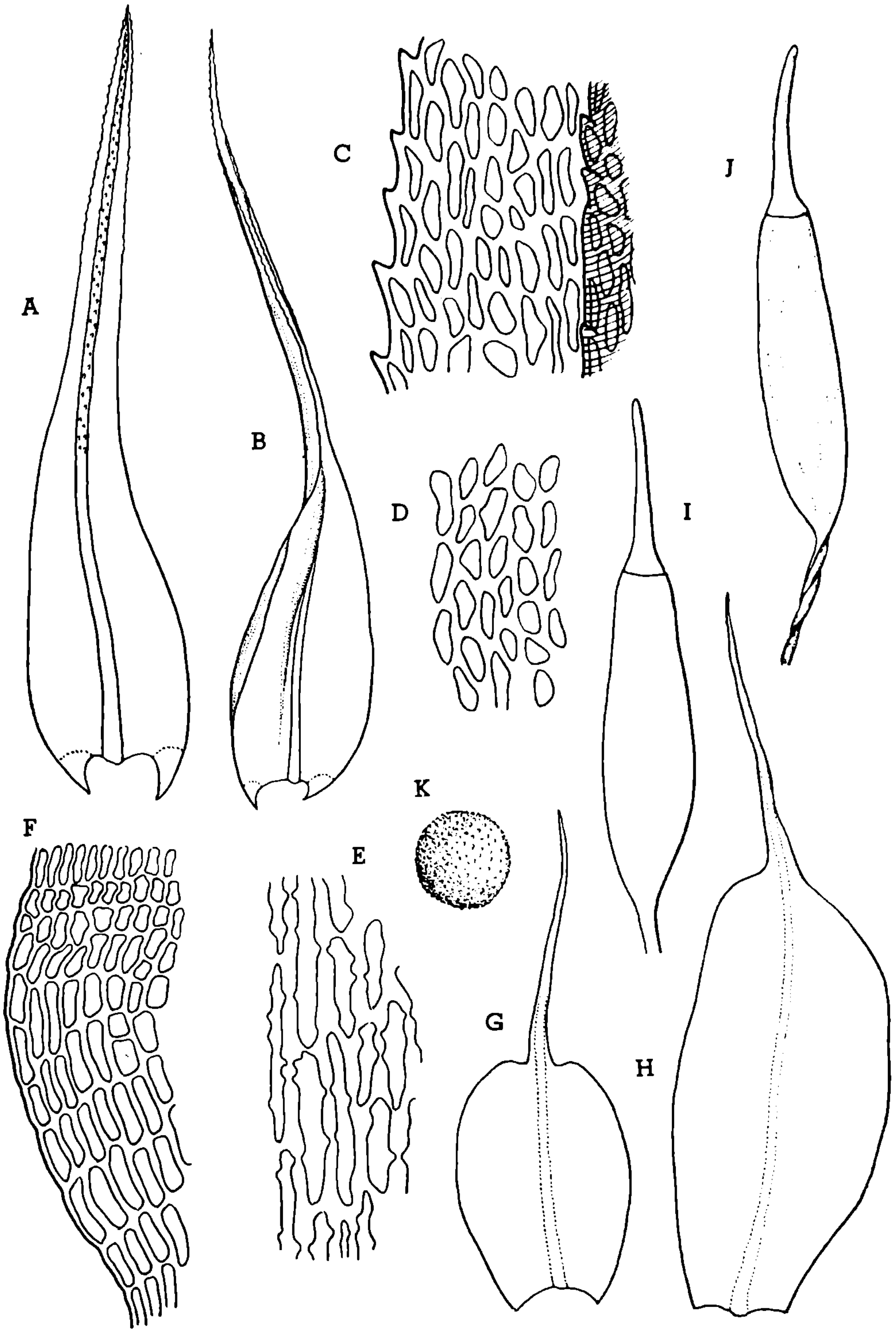

Fig. 33. *Dicranum gymnostomum* Mitt.

A. Leaf, opened (dorsal view), ×15. B. Leaf, ×15. C, D. Cells in the upper and middle parts of leaf, respectively, ×312. E. Cells just above the alar part of leaf, ×312 F. Cells in the alar part of leaf, ×138. G. Perichaetial leaf, opened (outermost), ×15. H. Do. (innermost), ×15. I. Capsule (when moist), ×15. J. Do. (when dry), ×15. K. Spore, ×720. (drawn from the holotype in NY).

less sharply bounded from upper incrassate cells " were observed also in the present specimens from Sikkim and Darjeeling.

Dicranodontium uncinatum (Harv.) Jaeg. in Ber. Sci. Gall. Naturw. Ges. **1877–78**: 380 (1880).

E. Nepal: Helok–Baroya Khimty, 1500–2500 m. Sikkim: below Bakkim–Jongri, 4000 m, Jongri, 4000–4200 m. Darjeeling: Ramam, 2300 m; Phalut, 3550 m.

Distr. Nepal, Sikkim, Khasia, Manipur, Moluccas, Java, Philippines, Vietnam, Laos, Malay Pen., Burma, Thai, Formosa, and Japan.

Dicranoloma fragile Broth. in Engl., Pfl.-fam. ed. 2, **10**: 209 (1924).

Sikkim: Yoksam, 1700 m.

Distr. Nepal, Sikkim, Khasia, Assam, Manipur, S. India, Burma, Annam, Vietnam, Thai, and Philippines.

Dicranum crispifolium C. Muell. in Bot. Zeit. **22**: 349 (1864).

E. Nepal: Baroya Khimty–Thakma Khola, 2500–3000 m.

Distr. Nepal, Sikkim, Bhutan, Bengal, S. India, and NW. Yunnan.

Dicranum gymnostomum Mitt. in Journ. Linn. Soc. Suppl. **1**: 14 (1859).

D. gymnostomoides Broth. in Symb. Sin. **4**: 25 (1929), syn. nov. [Fig. 33]

Sikkim: Migothang–Nayathang, 3900–3300 m; Jongri, 4000 m; Jongri–Gamothang, 3600–4200 m.

Distr. Sikkim, and Yunnan.

The type specimen in NY, collected by J. D. Hooker in Lachen, was examined. This is very distinct in having narrow-mouthed and oblong-cylindrical capsules lacking peristome teeth, and long leaves with alar part composed of about 4 layers of cells. The species *D. gymnostomoides* was described on the syntype specimens (7142 & 9817) from NW. Yunnan, which are preserved in H. The specimen no. 9817 agrees apparently with *D. gymnostomum* in its structural details. Brotherus seems to have noticed this, because we can find the manuscript written by Brotherus himself on the label of no. 9817 specimen as "*D. gymnostomoides=D. gymnostomum.*"

Dicranum himalayanum Mitt. in Journ. Linn. Soc. Suppl. **1**: 14 (1859).

E. Nepal: below Siling Tzokupa–Siling Tzokupa, 2000–3000 m. Sikkim: Jongri, 4000 m.

Distr. W. Himalaya, Nepal, Sikkim, and Bhutan.

Compared with the type specimen in NY, collected by Griffith in Bhutan. The oblong-ovoid and erect capsules are the most characteristic features of this species.

Dicranum lorifolium Mitt. in Journ. Linn. Soc. Suppl. **1**: 15 (1859).

E. Nepal: near Chyangthaphu–Chyangthaphu–Birwa, 1100–2100 m.

Distr. Kashmir, Nepal, Bengal, Bhutan, Khasia, and Naga Hills.

Compared with the type specimen in NY, collected in Kashmir.

Dicranum scoparium Hedw., Sp. Musc. 126 (1801).

Sikkim: below Bakkim–Jongri, 4000 m, +*Dicranodontium dimorphum.*

Distr. Caucasus, Kashmir, Sikkim, Yunnan, Szechuan, Soviet Far East, Korea, Japan, Europe, Azores, Madeira, Canaries, N. America, and New Zealand.

Oncophorus Wahlenbergii Brit., Bryol. Univ. **1**: 400 (1826).

Sikkim: Jongri, 4000 m.

Distr. Europe, Kashmir, Sikkim, NW. Yunnan, and NE. Asia including Japan.

Oreoweisia laxifolia (Hook. f.) Kindb., Enum. Bryin. Exot. 69 (1888).

C. Nepal: Kathmandu Airport. E. Nepal: Zongi-Iladanda, 1800–2700 m; Siling Tzokupa, 2000–3000 m; Thakma Khola-Yamphodin, 2100–3300 m; Selap-Walunchung Gola, 2600–3200 m; Walunchung Gola-Zongi, 2700–3800 m. Darjeeling: Phalut, 3550 m, +*Symblepharis helicophylla*; Sandakphu-Tonglu, 2600–3550 m.

Distr. Kashmir, W. Himalaya, Nepal, Sikkim, Yunnan, Assam, S. India, and Japan.

This seems to be a very common plant in the present regions. Fruits are found in all the 11 packets.

Symblepharis helicophylla Mont. in Ann. Sci. Nat. ser. 2, **8**: 252 (1837).

E. Nepal: Birwa-Yektin, 1200–2500 m; Yamphodin-Ghatte, 1600–2100 m; Thakma Khola-Yamphodin, 2100–3300 m. Sikkim: Migothang, 3900 m-Nayathang, 3300 m, +*Dicranum himalayanum*; Migothang, 3900 m; Jongri-Olothang, 4000–3900 m. Darjeeling: Phalut-Sandakphu, 2600–3550 m +*Entodon* sp., +*Campylopus* sp., +*Dicranodontium* sp.

Distr. W. Himalaya, Nepal, Sikkim, Assam, Bengal, Yunnan, Szechuan, Mexico to Panama.

Fruits are found in all the 19 packets. This species is remarkable in that it is distributed disjunctively on both sides of the Pacific.

Symblepharis Reinwardtii (Doz. et Molk.) Mitt. in Trans. Roy. Soc. Edinb. **31**: 331 (1888).

E. Nepal: below Siling Tzokupa-Siling Tzokupa, 2000–3000 m; Bhuspate Danra, 2600 m. Darjeeling: Senchal, 2400 m; Senchal-Tiger Hill, 2500 m.

Distr. Nepal, Sikkim, Assam, Bengal, Naga Hills, Burma, Java, Borneo, Philippines, and Formosa.

In the present regions, this species seems to be distributed in the areas below 2600 m in altitude, unlike *S. helicophylla*, which ascends up to about 3900 m.

Trematodon Hookeri C. Muell. in Bot. Zeit. **46**: 350 (1864).

E. Nepal: Bhuspate Danra-Mai Majuwa, 1600–2900 m. Darjeeling: Sandakphu-Tonglu, 2600–3550 m, +*Oreoweisia laxifolia.*

Distr. E. Nepal, Sikkim, and Bengal.

This species resembles *T. longicollis* in the structural details, but this is characterized especially by its large spore. As for the size of spore, ±25 μ in diameter was described by Gangulee (1960), and 25–30 μ by Roth (1911). In the present specimens, about 23 μ is observed (up to 20 μ in *T. longicollis*).

LEUCOBRYACEAE (by Akira Noguchi)

Octoblepharum albidum Hedw., Sp. Musc. 50 (1801).

Sikkim: Pamianchi-Gayzing Bazar, 2000–1550 m. Nepal: Taplejung-Garhi Danra, 1700–2000 m; Tuwa-Taplethok, 1300–1600 m; Khebang-below Siling Tzokupa, 1500–2000 m, +*Syrrhopodon Gardneri.*

Distr. Africa, Himalaya, Assam, Burma, Thai, Vietnam, China, Indonesia, Philippines, Oceania, and N. & S. America.

CALYMPERACEAE (by Zennoske Iwatsuki)

Syrrhopodon Gardneri (Hook.) Schw., Suppl. **2** (2): 110 (1826).

Nepal: Khebang–below Siling Tzokupa, 1500–2000 m, +*Octoblepharum albidum*.
Distr. Himalaya, Ceylon, and Java.

POTTIACEAE (by Akira Noguchi)

Barbula constricta Mitt. in Journ. Linn. Soc. Suppl. **1**: 33 (1859).

Darjeeling: Sandakphu–Tonglu, 3550–2600 m. Nepal: Baroya Khimty–Thakma Khola, 2500–3000 m; Ghatte–Khebang, 1600–2200 m.

Distr. Pakistan, Himalaya, India, Burma, Yunnan, Indonesia, and Philippines.

Bellibarbula Kurziana (Hampe) Chen in Hedwigia **80**: 223 (1941).

Darjeeling: Phalut, 3550 m.

Distr. Himalaya, and India.

Bryoerythrophyllum atrorubens (Besch.) Chen in Hedwigia **80**: 262 (1941).

Nepal: Taplejung, 1700 m.

Distr. Himalaya, and China.

Bryoerythrophyllum dentatum (Wils.) Chen in Hedwigia **80**: 253 (1941).

Sikkim: Jongri–Olothang, 4000–3900 m.

Distr. Himalaya, India, and Indo-China.

Bryoerythrophyllum gymnostomum (Broth.) Chen in Hedwigia **80**: 255 (1941).

Sikkim: Gangtok, 1900 m.

Distr. Sikkim, and China. New to Himalaya.

Bryoerythrophyllum cf. **yunnanense** (Herz.) Chen in Hedwigia **80**: 259 (1941).

Darjeeling: Phalut, 3550 m.

Distr. E. Himalaya, and China. New to Himalaya.

So far as can be determined from Chen's illustration (1941), the collection has slightly different features from his description. The leaves of this collection have revolute margins only on the lower half in contrast to the entire length of *B. yunnanense*, and the marginal teeth are present on the upper half of leaves. On the other hand, the shape of leaves and areolation are very similar to those of *B. yunnanense*. Thus, for the present, it may be better to refer the collection to that species.

Desmatodon gemmascens (Broth.) Chen in Hedwigia **80**: 297 (1941).

Darjeeling: Phalut–Sandakphu, 3200–3550 m, +*Cynodontium* sp. Nepal: Minchin Dhap–Mul Pokhari, 2400–2800 m.

Distr. E. Himalaya, and China. New to Himalaya.

So far as can be determined from Chen's illustration (1941), the collections seem to be referable to this species.

Gymnostomum recurvirostre Hedw., Sp. Musc. 33 (1801).

Nepal: Thakma Khola–Yamphodin, 2100–3300 m; Ghatte–Khebang, 1600–2200 m.

Distr. Almost cosmopolitan.

Hyophila involuta (Hook.) Jaeg. in Ber. Sci. Gall. Naturw. Ges. **1871–72**: 354 (1873).

Sikkim: Yoksam, 1700 m. Nepal: Bilbatay Bhanjang, 2200 m; Selap–Walunchung Gola, 2600–3200 m; Iladanda–Helok,; Bhuspate Danra–Mai Majuwa, 1600–2900 m.

Distr. Europe, Asia (excl. Siberia), Africa, Oceania, and S. & N. America.

In his revision of the Asiatic Pottiaceae, Chen (1941) listed many species as synonyms of *H. involuta*, but it needs further revisions on the *H. involuta* group.

Hyophila spathulata (Harv.) Jaeg. in Ber. Sci. Gall. Naturw. Ges. **1871–72**: 353 (1873).

Nepal: Baroya Khimty–Thakma Khola, 2500–3000 m.

Distr. Himalaya, India, and China.

Leptodontium Handelii Thér. in Ann. Crypt. Exot. **5**: 171 (1932).

Sikkim: Jongri, 4000 m.

Distr. E. Himalaya and China.

Leptodontium squarrosum (Hook.) Hampe in Lindb. Oefv. K. Vet. Ak. Foerh. **21**: 227 (1864).

Nepal: Bhuspate Danra, 2600 m.

Distr. Africa, Himalaya, India, Indo-China, Indonesia, and C. America.

Merceya gedeana (Lac.) Noguchi in Kumamoto Journ. Sci. B, 2, **2**: 247 (1956).

Nepal: Selap–Walunchung Gola, 2600–3200 m.

Distr. Himalaya, India, Java, Philippines, Formosa, Korea, Japan, and S. America.

Merceya ligulata (Spr.) Schimp., Syn. Musc. ed. 2, 852 (1876).

Nepal: Selap–Walunchung Gola, 2600–3200 m; Thakma Khola–Yamphodin, 2100–3300 m.

Distr. Macaronesia, Europe, Caucasus, Asia Minor, Himalaya, Java, China, Formosa, Japan, and N. America.

Molendoa Roylei (Mitt.) Broth. in Engl., Pfl.-fam. I, **3**: 391 (1902).

Nepal: Iladanda–Selap, 1800–2600 m.

Distr. Himalaya, India, Indochina, and China.

Trichostomum brachyodontium Bruch in Flora **2**: 393 (1829).

Darjeeling: Phalut, 3550 m.

Distr. N. Africa, Europe, E. Himalaya, and N. & C. America.

Trichostomum cylindricum (Bruch) Mvll., Syn. **1**: 586 (1849).

Darjeeling: Kurseong, 1550 m. Sikkim: Yoksam, 1700 m; Gangtok, 1700 m. Nepal: Taplejung, 1700 m; Zongi–Iladanda, 1800–2700 m.

Distr. Europe, Himalaya, and C. & S. America.

GRIMMIACEAE (by Akira Noguchi)

Coscinodon cribrosus (Hedw.) Spruce in Ann. Mag. Nat. Hist. ser. 2, **3**: 491 (1849).

Darjeeling: Phalut, 3550 m.

Distr. N. Africa, Europe, Asia, and N. America.

Grimmia ovalis (Hedw.) Lindb. in Act. Soc. Sci. Fenn. **10**: 75 (1871).

Sikkim: Migothang–Nayathang, 3300 m.

Distr. Africa, Europe, Sikkim, China, Japan, Siberia, and N. America.

I have referred this sterile collection to this species with some hesitation.

Ptychomitrium Tortula (Harv.) Jaeg., Adumb. **1**: 382 (1872–73).

Darjeeling: Phalut, 3550 m. Nepal: Yamphodin–Ghatte, 1600–2100 m.

Distr. Himalaya, Nilghiri, and Yunnan.

This species is similar to *P. formosicum* Broth. in its leaves crispate when dry and in the areolation of leaves. But it is distinguished by the more robust plants, by the broader leaf-acumens and by the shorter setae. Another ally of this species is *P. polyphylloides*[1] which is identical with *P. longisetum* Reim. et Sak. In *P. Tortula* the plants are robust and provided with less branches, the leaves are more strongly crispate than those of *P. polyphylloides*. The cells at the leaf-insertion serve to distinguish *P. Tortula* from both *P. formosicum* and *P. polyphylloides* by its brown cell-walls with localized thickenings which form a well-defined area.

Rhacomitrium crispulum (Hook. f. et Wils.) Hook. f. et Wils., Fl. Tasman. 181 (1867).

R. javanicum Doz. et Molk., Bryol. Jav. **1**: 105, t. 84 (1855–61).

R. himalayanum (Mitt.) Jaeg., Ad. I: 375 (1862–73).

R. javanicum var. *incanum*, *R. angustifolium*, et *R. dicarpum* Broth. in Symb. Sin. **4**: 46–47 (1929).

Sikkim: below Bakkim–Jongri, 4000 m; Jongri, 4000 m, +*Dicranodontium* sp, +*Grimmia* sp.; Jongri–Pregi Chu, 3600 m–Olothang, 3900 m; Jongri–Choktschering Chu, 4300 m; Gamothang, 3900 m; Migothang, 3900 m. Darjeeling: Darjeeling, 2000–2200 m, +*Rozea pterogonioides*; Batasi, 2150 m; Phalut, 3550 m, +*Rozea pterogonioides*; Phalut–Sandakphu, 3200–3550 m; Sandakphu–Kala Pokhari, 3000 m–Garibans, 2800 m–Tonglu, 3000 m. Nepal: Hati Sar–Michin Dhap, 2600–3000 m; Minchin Dhap–Mul Pokhari, 2400–2800 m; Selap–Zongi–Walunchung Gola, 2600–3200 m; Zongi–Iladanda, 1800–2700 m; Iladanda-Helok, 1500–1900 m; Baroya Khimty–Thakma Khola, 2500–3000 m; below Siling Tzokupa–Siling Tzokupa, 2000–3000 m; Changthaphu–Birwa, 1100–2100 m; Birwa–Yektin, 1200–2500 m; Batasay–Bhuspate Danra, 2300–2600 m; Mai Majuwa–Danra Pani, 1500–1900 m.

Distr. Himalaya, Indonesia, E. Australia, New Zealand, and C. & S. America.

This species seems to be common at high elevations in the Himalayas. The collections listed above are not uniform. If the stems are robust and bear few and long branches, the collections are referable to *R. javanicum* which was reduced to a synonym of *R. crispulum* by Bartram (1942). The leaves of this form are large and with rather a short leaf-point. On the other hand, in certain collections which were usually from high elevations, such as 4000 m altitude, the stems bear short, pinnate and silver grayish branches. The leaves of this form are usually provided with hyaline leaf-points. The length of the leaf-point varies considerably from one specimen to another, and even from different parts of the same plant. Having examined a considerable number of specimens of *R. javanicum*, I have found that the leaves have long or short leaf-points and not rarely they have obtuse apices. I have observed also that certain branch-leaves of the type specimen of *R. himalayanum* have non-piliferous points, and the branch-leaves of *R. fuscescens* which is similar to *R. javanicum* in appearance and ramification is mostly broadly obtuse at the apices. *R. javanicum* var. *incanum* was founded by Brotherus, merely because it had long leaf-points and robust plants. But it appears to me to be *R. crispulum.* In revising the numerous collections, I found it impossible to separate the forms on a basis of shorter or longer, hyaline leaf-points, because they intergrade from one extreme to the other.

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[1] **Ptychomitrium polyphylloides** (C. M.) Par.
Brachysteleum polyphylloides C. Mull. in Nuov. Giorn. Bot. Ital. 107 (1896); 189 (1898).
Ptychomitrium longisetum Reim. et Sak. in Bot. Jahrb. **64**: 541 (1931).

I have examined many collections with the following combination of characters: long leaf-points and stems with many short branches. Such forms resemble *R. himalayanum.* When short leaf-points of leaves are found in plants which almost lack short, lateral branches, and have somewhat fasciculate branches, the collections have been referred to *R. javanicum.* The best development of long leaf-points affords the plants a grayish appearance. Such an example is also found in *R. lanuginosum.* Tallis (1959) concluded that the length of the leaf-point may well be controlled both by an autogenic rhythm and by environmental factors, such as light intensity and air-humidity.

I have examined the original specimens of *R. angustifolium* Broth., with short branches (Iter, no. 9489, from Yunnan) and *R. dicarpum* Broth., with short fasciculate branches (Iter, no. 8067, from Yunnan). Both specimens seem also to be conspecific with *R. crispulum.*

FUNARIACEAE (by Harumi Ochi)

Funaria hygrometrica Hedw., Sp. Musc. 172 (1801).

Darjeeling: Sandakphu–Tonglu, 3550–2600 m.

Distr. Cosmopolitan.

SPLACHANACEAE (by Akira Noguchi)

Tayloria indica Mitt. in Journ. Linn. Soc. Suppl. **1**: 57 (1859).

Sikkim: Pamianchi–Gayzing Bazar, 2000–1550m; Yoksam, 1700 m. Nepal: near Siling Tzokupa, 2000–3000 m, +*Leptohymenium tenue.*

Distr. Himalaya, India, and Japan.

Tayloria subglabra (Griff.) Mitt. in Journ. Linn. Soc. Suppl. **1**: 57 (1859).

Nepal: Zongi–Iladanda, 1800–2700 m.

Distr. Himalaya, and W. China (Yunnan).

Tetraplodon angustatus (Hedw.) B. S. G., Bryol. Eur. fasc. 23–23, Mont. 4, t. 1 (1844).

Sikkim: Jongri–Choktschering Chu, 4000–4300 m.

Distr. Europe, Sikkim, W. China (Yunnan), Japan, and N. America.

BRYACEAE (by Harumi Ochi)

Brachymenium acuminatum Harv. in Hook., Icon. Pl. **1**: t. 19 (1836).

Nepal: Bilbatay Bhanjang–Hati Sar, 2200–3000 m.

Distr. India, Himalaya, and Philippines.

Brachymenium longicolle Thér. in Bull. Soc. Bot. Genève **26**: 85, *ic.* (1936).

Nepal: Bilbatay Bhanjang, 2200 m; Bilbatay Bhanjang–Hati Sar, 2200–3000 m; Hati Sar–Minchin Dhap, 2600–3000 m; Taplejung–Garhi Danra, 1700–2000 m; Walunchung Gola–Zongi, 2700–3800 m; Helok–Baroya Khimty, 1500–2500 m; near Chyangthaphu–Birwa, 1100–2100 m; Batasay–Bhuspate Danra, 2300–2600 m; Bhuspate Danra, 2600 m; Minchin Dhap–Mul Pokhari, 2400–2800 m.

Distr. E. Himalaya (Nepal, Sikkim.)

Brachymenium napalense Hook. in Schwaegr., Sp. Musc. Suppl. 2 (1): 131 (1824).

Pamianchi, 2000 m; Gayzing Bazar, 1550 m; Yoksam, 1700 m; Gangtok, 1750–1900 m; Darjeeling, 2000–2200 m; Batasi-Palmajuwa, 2150–2300 m; Darjeeling, Victoria Fall, 1950 m; Ramam, 2400 m; Darjeeling-Ghum, 2800 m; Senchal, 2400 m; Tiger Hill-Darjeeling; Darjeeling, Happy Valley.

Distr. Himalaya (Nepal, Sikkim), India, Burma, Thai, Vietnam, New Guinea, China, Indonesia, Philippines, Formosa, and Japan.

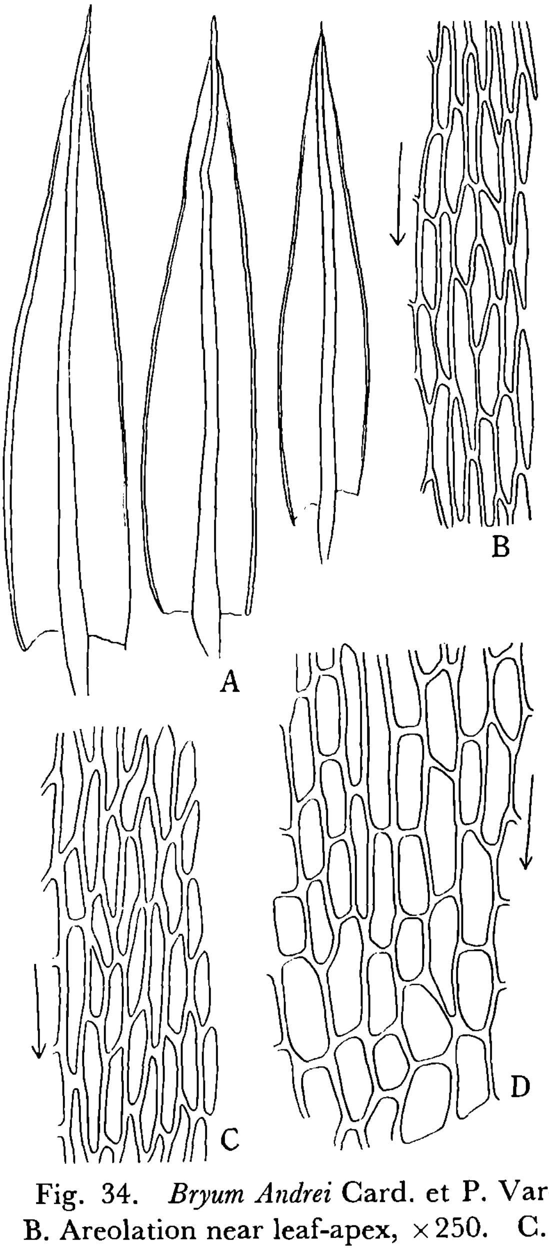

Fig. 34. *Bryum Andrei* Card. et P. Vard.
A. Leaves, ×28. B. Areolation near leaf-apex, ×250. C. Ditto from median part, ×250. D. Ditto from the base, ×250. Drawn from the type: E. India: Maduré, Kodicanal, coll. Rev. André, 1909, No. 86 (PC).

Seemingly very common at the altitudes of ca. 1500 to 3000 m in both Sikkim and E. Nepal. It may be of interest that this moss sometimes occurs on rocks in Sikkim though it generally does epiphytically.

Brachymenium ptychothecium (Besch.) Ochi in Adv. Front. Pl. Sci. **4**: 108, pl. 2 (1963).

Preig Chu, below Bakkim, 2200 m; Ramam, 2400 m; Phalut; Phalut-Sandakphu; Sandakphu-Tonglu.

Distr. E. India, E. Nepal, Sikkim, and W. China (Yunnan).

Seemingly rather common in both Sikkim and E. Nepal.

Bryum Andrei Card. et P. Vard. in P. Vard., Rev. Bryol. **50**: 20, 6 (1923). [Fig. 34]

Nepal: Yamphodin-Ghatte, 1600-2100 m.

Distr. E. India (Madura), and new to Nepal.

This moss has been described on sterile material only. The material cited here is sterile, too. The illustration presented by P. Varde is not so good. Thus, I dare to illustrate it here again.

Bryum argenteum Hedw., Sp. Musc. 181 (1801).

var. **lanatum** (P. Beauv.) Hamp. in Linnaea **13**: 44 (1839).

Sikkim: Yoksam; Jongri, 4000 m.

Distr. Cosmopolitan.

Bryum auratum Mitt. in Journ. Linn. Soc. Suppl. **1**: 67 (1859).

B. cymbifolium Lindb. in Not. Saellsk. Faun. Fl. Fenn. **11**: 45 (1870).

Anomobryum cymbifolium (Lindb.) Broth. in Rec. Bot. Surv. India **1**: 320 (1899).

Nepal: Bilbatay Bhanjang-Hati Sar, 2200-2900 m; Taplethol-Helok, 1400-1600 m Iladanda-Selap, 1800-2600 m; Selap-Walunchung Gola, 2600-3200 m; Yamphodin-Ghatte; Bhuspate Danra-Mai Majuwa, 3100-1600 m; Mai Majuwa-Dhara Pani, 1500-1900 m.

Distr. E. Himalaya (Nepal, Sikkim), and India.

Bryum cymbifolium had first been proposed as *Brachymenium filiforme* Griff. in 1843 based on Khasian material. But, if we treat this moss as a member of *Bryum* or *Anomobryum*, the name is a later homonym. Thus, *Bryum cymbifolium* has been proposed later. Examining the type material of *Brachymenium filiforme* (in BM) in detail, however, it seems to be better included within the range of the present moss. The costa ceasing far below the apex of leaf, the operculum strongly rostrate and the incomplete inner peristome are the most remarkable characteristics for this moss.

Bryum Badhwarii Ochi, nom. nov.

B. himalayanum Dix. ex Ochi in Journ. Jap. Bot. **39**: 51, f. 9 (1964); non C. Muell. 1900.

Sikkim: Jongri-Choktsering Chu, 4000-4300 m.

Distr. N. W. Himalaya, and Sikkim.

Bryum capillare Hedw., Sp. Musc. 182 (1801).

Darjeeling: Phalut, 3500 m.

Distr. Wide-spread in both hemispheres.

Bryum filiforme Dicks., Pl. Crypt. Brit. **4**: 16 (1801).

var. **concinnatum** (Spr.) Boul., Musc. France 294 (1884).

Kurseong, 1550 m; Phalut, 3500 m; Ghum-Tiger Hill.

Distr. Wide-spread in northern hemisphere.

Bryum (Rhodobryum) **giganteum** (Schwaegr.) Arnott in Mem. Soc. Linn. Paris **5**: 279 (1827).

Nepal: Birwa-Yektin, 1200–1500 m.

Distr. Madagascar, S. and SE. Asia, Japan, and Hawaii.

Bryum plumosum Doz. et Molk., Musc. Frond. Ined. Archip. Ind. **3** (1844).

Nepal: Taplejung, 1700 m.

Distr. Nepal, India, Ceylon, Indonesia, China (Yunnan), Vietnam, and Philippines.

As the literature, in which this moss has originally been described, "Ann. Sci. Nat. Bot. ser. **3** (2) " (1844) has been cited in many books and papers as well. But this was published in November of 1844 and " Musc. Frond. Ined. Archip. Ind." cited above in July of the same year.

Bryum recurvulum Mitt. in Journ. Linn. Soc. Suppl. **1**: 74 (1859).

Nepal: Taplejung, 1700 m; Iladanda-Selap, 1800–2600 m; Bhuspate Danra, 2600 m.

Distr. India, Himalaya, China, Formosa, and Japan.

var. **flexicaule** (C. Muell.) Ochi in Adv. Front. Pl. Sci. **4**: 118 (1963).

B. flexicaule C. Muell. in Nuov. Giorn. Bot. Ital. n. ser. **3** (1): 96 (1896).

Nepal: Taplejung, 1700 m.

Distr. China (Shensi); new to Nepal.

Bryum retusifolium Card. et P. Vard. in P. Vard., Rev. Bryol. **50**: 20, 7 (1923).

Nepal: Iladanda-Helok, 1500–1900 m.

Distr. E. India (Madura); new to Nepal.

Bryum subrotundum Brid., Sp. Musc. **3**: 29 (1817).

Nepal: Selap-Walunchung Gola, +*Funaria hygrometrica*, *Bryum filiforme*, and *B. teretiusculum*.

Distr. Circumboreal.

Bryum teretiusculum Hook., Icon. Pl. **1**: t. 20, f. 1 (1836).

B. pseudoalpinum Ren. et Card. in Bull. Soc. Bot. Belg. **34**: 61 (1895).

Victoria Fall, Darjeeling.

Distr. Himalaya, India, China, Formosa, Korea, and Japan.

var. **reflexifolium** (Ochi) Ochi, comb. nov.

B. pseudoalpinum var. *reflexifolium* Ochi in Journ. Jap. Bot. **39**: 52, f. 10 (1964).

Nepal: Selap-Walunchung Gola, 2600–3500 m.

Distr. E. Nepal, and Sikkim.

Bryum Thomsonii Mitt. in Journ. Linn. Soc. Suppl. **1**: 75 (1859).

Sikkim: Yoksam, 1700 m. Nepal: Iladanda-Selap, 1800–2600 m; Selap-Walunchung Gola, 2600–3200 m; Yamphodin-Ghatte, 1600–2100 m.

Distr. Baltistan, Kashmir, Nepal, Sikkim, and China (Tibet).

Bryum truncorum (Brid.) Brid., Mant. Musc. 119 (1819).

Sikkim: Yoksam, 1700 m.

Distr. Pan-tropical.

Bryum Wightii Mitt. in Journ. Linn. Soc. Suppl. **1**: 74 (1859).

Nepal: Iladanda-Selap, 1800-2600 m; Walunchung Gola-Zongi, 3800-2600 m.

Distr. Nepal, India, and Ceylon.

Plagiobryum Zieri (Dicks.) Lindb. in Oefv. Kongl. Vet.-Akad. Foerh. **19**: 606 (1862).

Sikkim: Migothang, 3900 m.

Distr. Circumboreal.

Pohlia acuminata Hoppe et Hornsch. in Flora **2**: 94 (1819).

Sikkim: Gamothang, 3900 m.

Distr. Circumboreal.

Pohlia camptotrachela (Ren. et Card.) Broth. in Engl., Pfl.-fam. I, **3** (1): 552 (1903).

Nepal: near Chyangthaphu-Birwa, 1100-2100 m.

Distr. Nearly circumboreal.

Pohlia cruda (Hedw.) Lindb., Musc. Scand. 18 (1879).

Darjeeling: Phalut, 3200-3550 m.

Distr. Circumboreal areas, Australia and Antarctics.

Pohlia elongata Hedw., Sp. Musc. 171 (1801).

Jongri, 4000 m; Phalut, 3500 m; Sandakphu, 3550 m; Kola Pokhari, 3000 m Garibans, 2800 m; Tonglu, 3000 m.

Distr. Wide-spread in the Northern Hemisphere and Africa.

Pohlia flexuosa Hook., Icon. Pl. **1**: t. 19, f. 5 (1837).

Gangtok 1750 m; Birch Hill, Darjeeling, 2000 m.

Distr. Himalaya, India, Ceylon, China, Sumatra, Philippines, Formosa, Japan, Central America, and north-western part of S. America.

Pohlia longicolla (Hedw.) Lindb., Musc. Scand. 17 (1879).

Sandakphu-Tonglu, 3550-3000 m.

Distr. Circumboreal.

MNIACEAE (by Akira Noguchi)

Mnium confertidens (Lindb. et Arn.) Kindb., Enum. Bryin. 107 (1891). [Fig. 35]

Astrophyllum confertidens Lindb. et Arn. in K. Svensk. Vet. Ak. Handl. **23** (10): 17 (1890).

M. arbusculum Mull. in Nuov. Giorn. Bot. Ital. n. ser. **5**: 161 (1898).

Darjeeling: Phalut, 3550 m. Nepal: Taplejung, 1700 m, no. 236137, +*Trachypus bicolor*, +*Thuidium cymbifolium*; Thakma Khola-Yamphodin, 2100-3300 m; Baroya Khimty-Thakma Khola, 2500-3000 m.

Distr. E. Himalaya, N. E. China, Siberia, N. Korea, and Japan.

In 1964, Smirnova discussed the relationships among *M. arbusculum*, *M. confertidens* and *M. undulatum*. As she shows, it is evident that *M. undulatum* differs specifically from the other two. Kabiersch and Smirnova distinguish *M. confertidens* from *M. arbusculum* by its large cells, by its obtuse leaf-apices, and by its small teeth of leaf-margins, etc. But, I doubt if *M. arbusculum* can be satisfactorily separated from *M. confertidens* which is a fairly variable species. The variations in the shape of leaf-apices are found in a single collection, being obtuse and round. Although there is a tendency for *M. confertidens* to have more rounded leaf-apices,

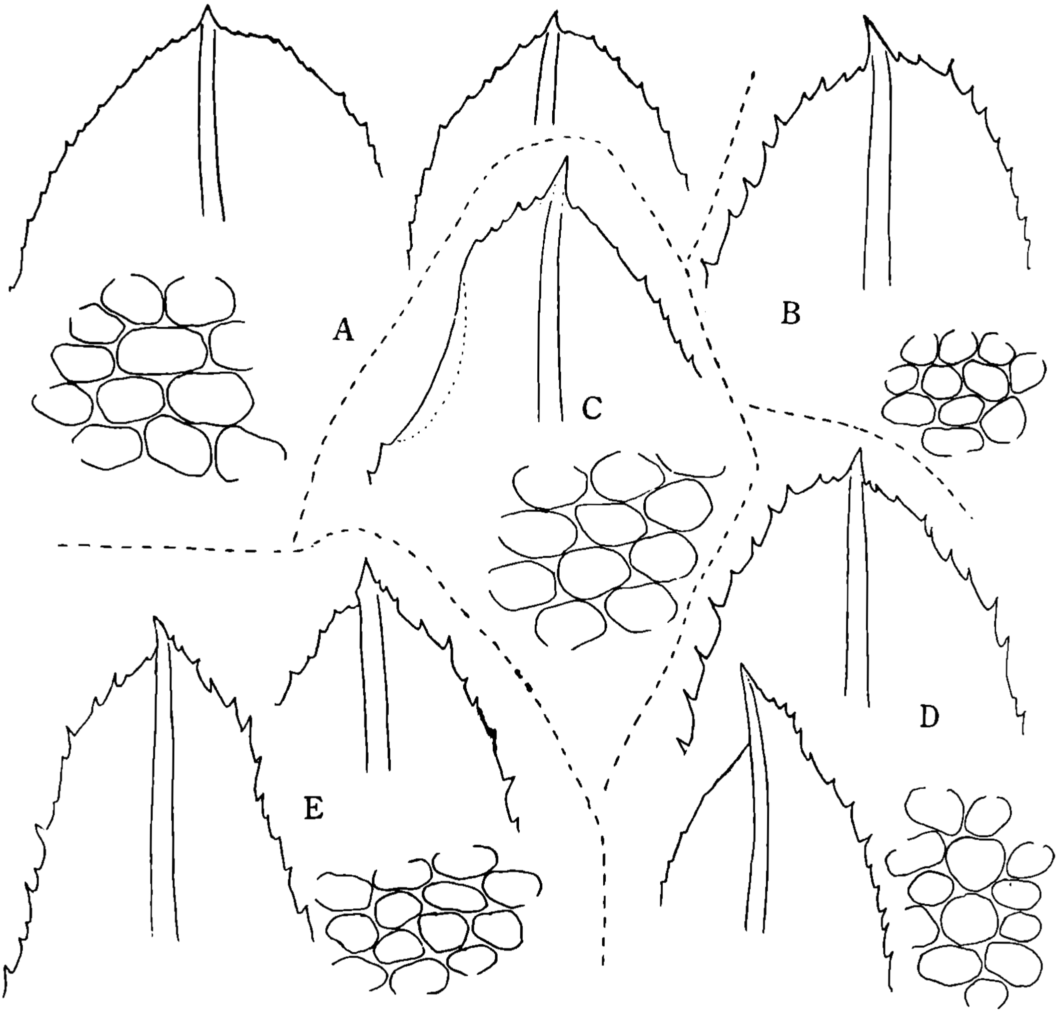

Fig. 35. *Mnium confertidens* (Lindb. et Arn.) Kindb. Leaf-apices (×27) and cells from middle of leaves (×333). A. From Ar-tau-hoodzu, Manchuria. B. From Ku-tong-hoo, Manchuria. C. From North Korea. D. From Mt. Ontake, central Japan. E. From Taplejung, Nepal (no. 236137).

larger leaf-cells and smaller marginal teeth, it is not always so. In the specimens from Ar-tau-hoodzu, Manchuria, north-eastern China (Fig. 35 A) and from North Korea (Fig. 35 C), the leaves have round spices, smaller marginal teeth and larger leaf-cells, thus they agree with *M. confertidens*. In the specimens from Ku-tong-hoo, Manchuria (Fig. 35 B) and from Japan (Fig. 35 D), the leaves have round leaf-apices, larger marginal teeth and smaller leaf-cells. Lastly the leaves of the collection no. 236137 from Nepal are rather acute, have larger teeth, and bear smaller cells. The above-mentioned characters seem to occur in any combination and are hardly geographically confined to certain areas. Therefore, the differences between *M. arbusculum* and *M. confertidens* which Smirnova emphasized seem to have minor systematic value.

I add here that the specimen in the Musci Japonici Exsiccati (ser. 9, no. 435, from Mt. Yatsugatake, Japan, erroneously determined as *Mnium undulatum*) is referred to *M. confertidens.*

Mnium japonicum Lindb. in Act. Soc. Sci. Fenn. **10**: 226 (1872).

Nepal: Walunchung Gola–Zongi, 2700–3800 m.

Distr. Nepal, China, and Japan.

The occurrence of this species is a noteworthy find. Although these plants are larger than those from Japan, there are no stable differential characters between them.

Mnium laevinerve Card. in Bull. Soc. Bot. Genève ser. 2, **1**: 128 (1909).

Sikkim: Migothang, 3900 m–Nayathang, 3300 m. Darjeeling: Darjeeling, 2000–2200 m.

Distr. Himalaya, India, China, Formosa, and Japan.

Mnium longirostre Brid. in Musc. Rec. **2** (3): 106 (1803).

Darjeeling: Darjeeling, Victoria Fall, 1950 m. Sikkim: Yoksam, 1700 m. Nepal: Selap–Walunchung Gola, 2600–3200 m; Ghatte–Khebang, 1600–2200 m.

Distr. Cosmopolitan.

This is a very widespread species and shows a vast variation in many parts, especially in the dentation of leaves. Usually the teeth of leaves are mamillate and composed of a single cell differing from border cells. Frequently the teeth are very small and not rarely they are inconspicuous.

Mnium cf. **lycopodioides** Schwaegr., Sp. Musc. suppl. **2** (2): 24 (1826).

Nepal: Hati Sar–Mangalbare–Lam Pokhari–Minchin Dhap, 2600–3000 m; Helok, 1500 m; Walunchung Gola–Zongi, 2700–3800 m, +*Mnium Maximowiczii*, +*Thuidium cymbifolium*; Baroya Khimty–Thakma Khola, 2500–3000 m, +*Macromitrium* sp.; Thakma Khola–Yamphodin, 2100–3300 m; Yamphodin, 2100–3300 m; Yamphodin–Ghatte, 1600–2100 m.

Distr. Europe, India, Himalaya, China and N. America.

Mnium Maximowiczii Lindb. in Act. Soc. Sci. Fenn. **10**: 224 (1872).

M. subundulatum Dixon in Hedwigia, **76**: 58 (1936).

Darjeeling: Kurseong, 1550 m; Takdah, 1600–1700 m; Batasi, 2150 m, +*Thuidium* sp.; Phalut, 3550 m. Sikkim: Yoksam, 1700 m; below Bakkim–Jongri, 4000 m, +*Thuidium* sp. Nepal: Hati Sar–Minchin Dhap, 2600–3000 m; Iladanda–Selap, 1800–2600 m, +*Thuidium cymbifolium*, +*Duthiella formosana*; Baroya Khimty–Thakma Khola, 2500–3000 m, +*Thuidium cymbifolium*, +*Macromitrium* sp.; Yamphodin–Ghatte, 1600–2100 m; Ghatte–Khebang, 1600–2200 m; Birwa–Yektin, 1200–2500 m; Walunchung Gola–Zongi, 2700–3800 m, +*Thuidium cymbifolium.*

Distr. Pakistan, Himalaya, China, Formosa, and Japan.

This seems to be a polymorphic species with a wide distribution. Usually the leaves are narrowly lingulate with retuse apices. In the collections from eastern Himalaya the leaves show rather little variation in form. In warmer regions the marginal teeth of leaves occasionally become smaller. The size of leaf-cells varies considerably, especially in a chain of much larger cells along the costa, and the undulation of leaves, which is the distinct character for the species, may become obscure. The setae are usually aggregated, two or three or more on a single stem, but occasionally they are solitary. These variations suggest a close affinity to *M. longirostre.*

Mnium pseudopunctatum Bruch et Schimp. in London Journ. Bot. **2**: 669 (1843).

Darjeeling: Sandakphu, 3550 m–Kala Pokhari, 3000 m–Garibans, 2800 m; Tonglu, 3000 m. E. Nepal: Yamphodin–Ghatte, 1600–2100 m; Bhandukay–Ghatte, 1600–2200 m.

Distr. Widely distributed in the Northern Hemisphere.

The differences between this species and *M. punctatum* have been discussed by Persson (1947, 58) and others. According to Persson this species is divided from *M. punctatum* by the tomentose stems, thick costa ending beneath the leaf-apex, globose capsule, reddish peristome and synoicous inflorescence. In morphological characters, *M. pseudopunctatum* is most similar to *M. punctatum* var. *elatum*, but differs in the synoicous inflorescence in contrast to the dioicous ones of the latter. Moreover, a difference which may be emphasized is that in *M. pseudopunctatum* leaf-cells are arranged in oblique lines from the costa outwards. A superficial study of the *M. punctatum* group shows that it is not wise to base the classification merely on morphological characters, such as the marginal border and the mucro of leaves, as usually has been done.

Mnium punctatum Schreb. in Hedw., Sp. Musc. 193 (1801).

Sikkim: Jongri, 4000 m, no. 200309. Darjeeling: Phalut–Sandakphu, 3200–3550 m, no. 200268.

Distr. Widely distributed in the Northern Hemisphere.

The stems of the collection no. 200309, being clothed with blackish brown rhizoids for the entire length contrast with those of no. 200268 which are naked. In Japanese collections the naked stems intergrade with the tomentose ones. Thus I am doubtful if such a character can be satisfactorily used to separate *M. punctatum* from related forms. Such a widespread species as *M. punctatum* seems to show different types in different regions. Indeed, a single set of characters is rarely confined to a certain area. Usually it is not easy to draw any sharp line of demarcation among such taxa as *M. punctatum* and *M. nudum*. It is hoped that monographic studies in conjunction with cytological researches will clarify the systematic status of *M. punctatum* and related taxa.

var. **Horikawae** (Nog.) Noguchi, stat. nov.

Mnium Horikawae Nog. in Trans. Nat. Hist. Soc. Formosa **24**: 290 (1934).

Sikkim: Jongri, 4000 m. Nepal: Baroya Khimty–Thakma Khola, 2500–3000 m; Bhandukay–Ghatte, 1600–2200 m.

Distr. var. E. Himalaya, and Formosa. New to Himalaya.

The costa is subpercurrent, and the marginal borders are distinct with 2–3 layers of linear cells except near the apex. The leaf-cells are not arranged in oblique lines as they are in *M. pseudopunctatum*. Thus it resembles closely *M. punctatum*. The stems of this variety are not clothed with rhizoids, thus resembling *M. nudum*. This variety has been known only from sterile plants. Several collections from Baroya Khimty–Thakma Khola bear two old sporophytes.

var. **reflexifolium** (C. Mull.) Kabiersch in Hedwigia **76**: 64 (1936). (det. Iwatsuki).

Nepal: Baroya Khimty–Thakma Khola, 2500–3000 m, +*Thuidium cymbifolium*.

Distr. var. Sikkim, and Nepal.

Mnium riparium Mitt. in Journ. Linn. Soc. **8**: 30 (1864).

Nepal: Baroya Khimty–Thakma Khola, 2500–3000 m; Thakma Khola–Yamphodin, 2100–3300 m; Senchal, 2200–2400 m.

Distr. Northern Hemisphere.

Mnium striatulum Mitt. in Trans. Linn. Soc. ser. 2, **3**: 167 (1891).

Darjeeling: Senchal–Senchal Lake–Tiger Hill, 2500 m. Sikkim: below Bakkim–Jongri, 4000 m.

Distr. E. Himalaya, and Japan.

This is a noteworthy find in Sikkim and Darjeeling. The collections are referable to *M. striatulum* in essential structures, but show some characters different from those of Japan. In certain collections the mucro of leaves is not distinct and the costa vanishes beneath the leaf-apex.

Mnium vesicatum Besch. in Ann. Sci. Nat. Bot. ser. 7, **17**: 345 (1893).

Nepal: Iladanda–Helok, 1500–1900 m.

Distr. E. Himalaya, China, and Japan.

Orthomniopsis dilatata (Mitt.) Noguchi, comb. nov.

Mnium dilatatum Mitt. in Journ. Linn. Soc. Suppl. **1**: 143 (1859).

O. japonica Broth. in Oefv. Finsk. Vet. Soc. Förh. **49**: 1 (1907).

Sikkim: Yoksam, 1700 m. Nepal: Tuwa–Taplethok, 1300–1600 m; Helok–Iladanda, 1500–1900 m; Iladanda–Selap, 1800–2600 m.

Distr. E. Himalaya, W. China (Szechuan, Yunnan), Philippines, Indonesia, New Guinea and Japan.

The type specimen of *Mnium dilatatum* is a characteristic plant, corresponding closely to *Orthomniopsis japonica* in gametophytic structures. Because *M. dilatatum* had been known in the sterile state only, Kabiersch (1936) suggests that *M. dilatatum* is very similar to *Orthomniopsis japonica.* As mentioned on the following page, the fertile collection which Chen identified as *Mnium dilatatum* is referable to *Orthomnium bryoides.* The collections listed above are all sterile. In *O. japonica* the non-apiculate but round leaf-apex and indistinct marginal border are characteristic. I have compared the Himalayan sterile collections with the fertile ones of *O. japonica* from Japan, and I could not find any stable differences in the foliation and in the structure of leaves between them. Thus, my opinion is that *Mnium dilatatum* and *Orthomniopsis japonica* are conspecific and should be placed in the genus *Orthomniopsis.*

Orthomnium bryoides (Griff.) Norkett in Trans. Brit. Bryol. Soc. **3**: 445 (1958). [Figs. 36 & 37]

O. dilatatum Chen in Fedde, Rep. **58** (1–3): 25 (1955), excl. basionym.

Sikkim: Yoksam, 1700 m, no. 200563; Preig-chu, below Bakkim, 2200 m; Gangtok, 1750 m. Darjeeling: Phalut, 3550 m, no. 200252, +*Brachymenium* sp.; Sandakphu–Tonglu, 3000–3550 m, +*Diaphanodon blandus.* Nepal: Hati Sar–Michin Dhap, 2600–3000 m, no. 236063; Taplejung, 1700 m; Taplejung–Garhi Danra, 1700–2000 m; Birwa–Yektin, 1200–2500 m, on branches of trees.

Distr. Himalaya, Burma, Thai, Laos, Yunnan, Szechuan, and Philippines.

Norkett (1958) discussed the presence of hairs on calyptra of this species. He mentioned that the number of hairs is influenced by the humidity at the station where the plants grow and concluded that *Orthomnium crispula* which is characterized by naked calyptra is conspecific with *O. bryoides.* I have examined several old and young calyptrae of *O. bryoides*. As shown in Fig. 36 the number of hairs is rather variable: some calyptrae bear dense long hairs on the entire area, but some young ones which have broken from vaginula bear only a few hairs even when the vaginula has a considerable number of hairs. No. 200563 in the collections listed above bears several ripe calyptrae clothed with dense, long and flexuose hairs. The hairs are composed of several cells at the base, surrounding a central canal and usually have a chain of a single row of cells in the upper part.

The leaves of collection no. 236063 have a long, percurrent costa, but those of nos. 200563 and 200252 taper upward from a stout base and end far beneath the leaf-apex. But, both extremes are also found in the same collection. Thus, I agree with Norkett that *O. bryoides* and *O. crispulum* are one and the same species. Fig. 37 shows the cross-section of a costa. Kabiersch (1936) figured a cross-section of a costa as composed of uniform cells throughout and lacking a strand. His figure probably was based on a section from the lower part of a leaf.

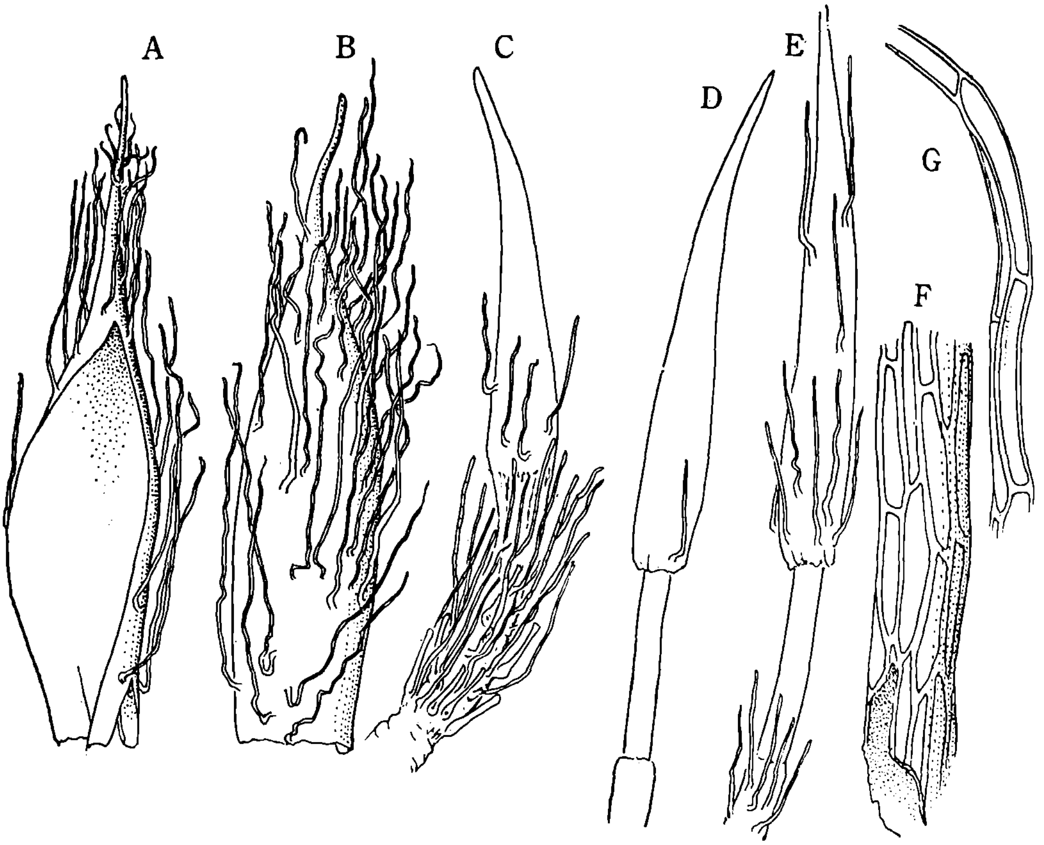

Fig. 36. *Orthomnium bryoides* (Griff.) Norkett
A, B. Calyptrae, ×13. C, D, E. Young sporophytes, ×13. F, G. Parts of hair (basal and superior), ×180.

According to the original description, the costa of *Orthomnium Loheri* Broth. vanishes below the leaf-apex. *O. Loheri* is similar to *O. bryoides* in many respects, but I think that the species are not conspecific. (Some specimens which Brotherus

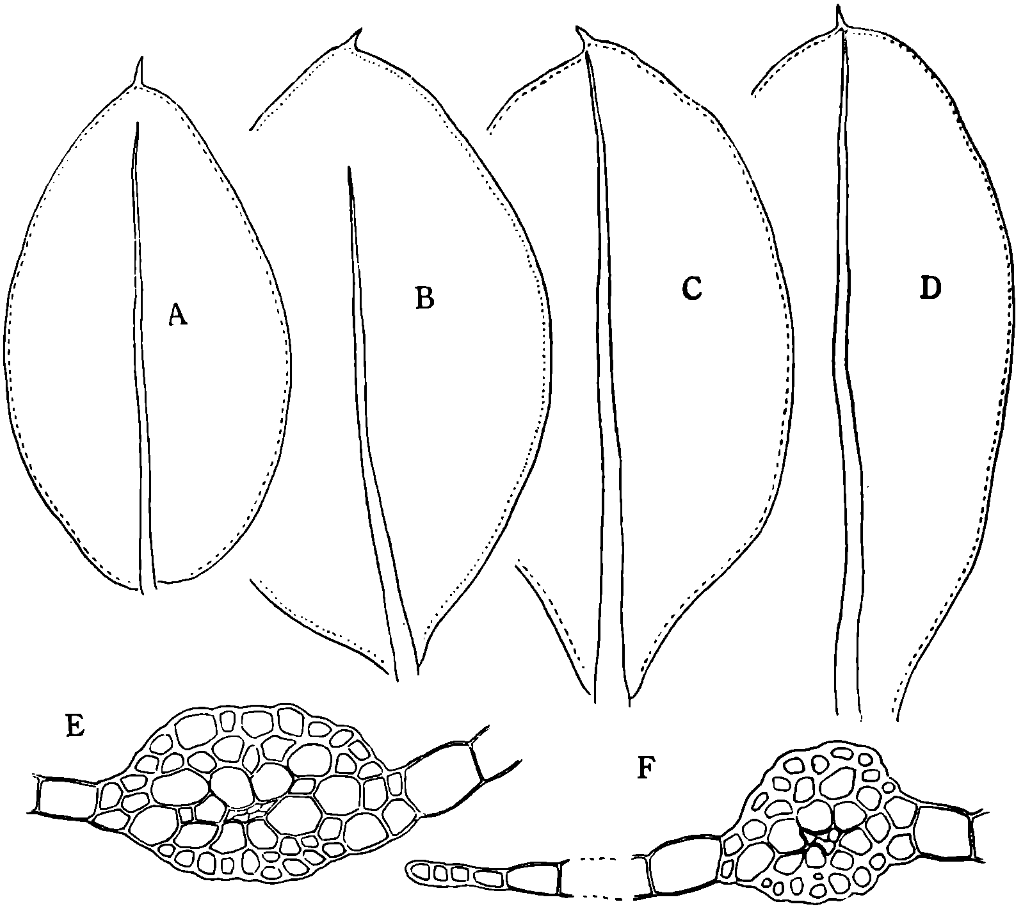

Fig. 37. *Orthomnium bryoides* (Griff.) Norkett
Leaves (× 13) and cross-sections of costa (× 180). A. From Yoksam, Sikkim (no. 200563). B. From Darjeeling, Phalut (no. 200252). C–F. from Hati Sar—Minchin Dhap (no. 236063).

cited when he published *O. Loheri* are identical with *Orthomniopsis dilatata*).

Here I wish to refer to Chen's treatment (1955) of *Mnium dilatatum*. Chen transfered *Mnium dilatatum* Mitt. to the genus *Orthomnium* and published a new combination, *O. dilatatum* (Mitt.) Chen, on the basis of the sporophyte having a long (1–1.5 cm) seta. After examination of the fertile collection indicated no. 257, through the courtesy of Chen, I came to the conclusion that the collection can be referred to *Orthomnium bryoides*. The single sporophyte in the collection that I examined is too young and bears a short seta covered with a young and smooth calyptra. However, the apiculate leaves, the distinct leaf-border with yellowish, linear cells and the long costa almost reaching leaf apex are characters of *O. bryoides*.

BARTRAMIACEAE (by Harumi Ochi)

Bartramia Halleriana Hedw., Sp. Musc. 164 (1801).
Rimbick-Ramam, 1900–2400 m.

Distr. Wide-spread in both hemispheres.

Bartramia ithyphylla Brid., Musc. Recent. **2** (3): 132, 1 f. 6 (1803).

Nepal: Baroya Khimty-Thakma Khola, 2500–3000 m; Siling Tzokupa, 2000–2300 m.

Distr. Circumboreal.

Bartramia pomiformis Hedw., Sp. Musc. 164 (1801).

Ghum-Senchal; Phalut; Sandakphu-Tonglu.

Distr. Wide-spread in both hemispheres.

Bartramidula bartramioides (Griff.) Wijk et Marg. in Taxon **7**: 289 (1958).

Sikkim: Yoksam, +*Bryum argenteum* var. *lanatum*. Nepal: Lower Road, Rabong La-Temi, 1000–1300 m.

Distr. N. W. Himalaya, Nepal, Sikkim, India, Philippines, and Formosa.

Breutelia dicranacea (C. Muell.) Mitt. in Journ. Linn. Soc. Suppl. **1**: 64 (1859).

Darjeeling: Phalut (200337). Sikkim: Yoksam, 1700 m; Jongri, 4000 m Nepal: below Siling Tzokupa 2000–3000 m.

Distr. E. India, and E. Himalaya (Nepal, Sikkim).

Based on the materials cited above, I have mentioned " *Breutelia* sp. (near to *B. dicranacea*) " in Journ. Jap. Bot. **39**: 54 (1964). After examining them in comparison with the type material (in NY) for the present moss in detail, I have come to conclude that the formers are sure to be referred to the latter.

Fleischerobryum longicolle (Hamp.) Loesk., Morph. Syst. Stud. Laubm. 127 (1910).

Nepal: Yamphodin-Ghatte, 1600–2100 m; Bhuspate Danra-Mai Majuwa, 3100–1600 m; Lower Road, Rabong La-Temi, 1000–1300 m.

Distr. E. Himalaya (Nepal), Indonesia, China, Formosa, and Japan.

Philonotis fontana (Hedw.) Brid.

var. **seriata** (Mitt.) Breidl., Laub. Steierm. 152 (1891).

Nepal: Taplejung, 1700 m.

Distr. Europe, Greenland, Caucasus, Siberia, Central Asia, N. W. Himalaya, Nepal, Japan, Korea, and N. America.

Philonotis revoluta Bosch et Lac., Bry. Jav. **1**: 158 (1861).

Darjeeling: Sandakphu-Tonglu, 3600–2800 m.

Distr. India, Indonesia, China, Philippines, Formosa, and Japan.

Philonotis socia Mitt. in Journ. Linn. Soc. **8**: 151 (1864).

Sikkim: Yoksam, 1700 m. Nepal: Dhankuta, 1200 m.

Distr. Nepal, Sikkim, S. China, Formosa, Korea, and Japan.

Philonotis Turneriana (Schwaegr.) Mitt. in Journ. Linn. Soc. Suppl. **1**: 62 (1859).

Nepal: Bhuspate Danra-Mai Majuwa, 3100–1800 m; Penlong La, near Gangtok, 2100 m; Lower Road, Rabong La-Temi, 1000–1300 m.

Distr. Himalaya, Burma, Indonesia, Philippines, China, Formosa, Japan, and Hawaii.

HEDWIGIACEAE (by Akira Noguchi)

Cleistostoma ambiguum (Hook.) Brid., Bryol. Univ. **1**: 154 (1826).

Sikkim: Dentam, 1450 m, on branches of shrubs; Yoksam, 1700 m. Nepal: Bilbatay Bhanjang–Hati Sar, 2200–3000 m; Minchin Dhap–Mul Pokhari, 2400–2800 m; Yamphodin–Ghatte, 1600–2100 m; Bhuspate Danra–Mai Majuwa, 1600–2900 m; Iladanda–Selap, 1800–2600 m.

Distr. Himalaya, Burma, Thai, Yunnan, and S. Szechuan.

ORTHOTRICHACEAE (by Akira Noguchi)

Orthotrichum Hookeri Wils. ex Mitt. in Journ. Linn. Soc. Suppl. **1**: 48 (1859).

Darjeeling: Phalut, 3550 m (det. Norkett); Phalut–Sandakphu, 3200–3550 m (det. Norkett); Sandakphu–Tonglu, 3550–2600 m. Sikkim: Migothang–Nayathang, 3300 m (det. Norkett); Migothang, 3900 m; Preig Chu, below Bakkim, 2200 m; Jongri–Gamothang, 4000–3750 m. Nepal: Selap–Walunchung Gola, 2600–3200 m; Walunchung Gola–Zongi, 2700–3800 m; below Siling Tzokupa-Siling Tzokupa, 2000–3800 m; Batasay–Bhuspate Danra, 2300–2600 m; Bhuspate Danra, 2600 m.

Distr. Himalaya, Szechuan, and Yunnan.

CRYPHAEACEAE (by Akira Noguchi)

Acrocryphaea concavifolia (Griff.) Bosch et Lac., Bryol. Jav. **2**: 106 (1864).

Nepal: Bilbatay Bhanjang–Hati Sar, 2200–3000 m; Minchin Dhap–Mul Pokhari, 2400–2800 m, +*Desmatodon gemmascens*; Helok–Baroya Khimty, 1500–2500 m.

Distr. Himalaya, India, Ceylon, Burma, Indonesia, and Philippines.

Sphaerotheciella sphaerocarpa (Hook.) Fleisch in. Hedwigia **55**: 282 (1914).

Darjeeling: Victoria Fall, 1950 m; Phalut, 3550 m, +*Diaphanodon blandus*; Phalut–Sandakphu, 3200–3550 m; Sandakphu–Tonglu, 3000–2600 m. Sikkim: Preig Chu, below Bakkim, 2200 m; Gangtok, 1750 m; Migothang–Nayathang, 3300 m. Nepal: Hati Sar–Minchin Dhap, 2600–3000 m; Iladanda–Selap, 1800–2600 m; Helok–Baroya Khimty, 1500–2500 m; below Siling Tzokupa–Siling Tzokupa, 2000–3000 m; Birwa–Yektin, 1200–2500 m; Bhuspate Danra, 2600 m.

Distr. Nepal, Sikkim, Szechuan, and Yunnan.

RHACOPILACEAE (by Akira Noguchi)

Rhacopilum orthocarpum Wils. ex Mitt. in Journ. Linn. Soc. Suppl. **1**: 136 (1859).

Sikkim: Yoksam, 1700 m, +*Meteoriopsis squarrosa*.

Distr. Himalaya.

TRACHYPODACEAE (by Akira Noguchi)

Diaphanodon blandus (Harv.) Ren. et Card. in Bull. Soc. Bot. Belg. **38**: 23 (1900).

Darjeeling: Darjeeling, 2000–2200 m; Senchal Rest House–Ghum, 2400–2200 m, on tree; Phalut, 3550 m, +*Rhacomitrium crispulum*, +*Paraleucobryum* sp., +*Pogonatum* sp.; Phalut–Dentam, 3600–1450 m. Sikkim: Migothang–Nayathang, 3300 m, +*Ulota* sp., +*Brachymenium* sp. Nepal: Bilbatay Bhanjang, 2200 m; Hati Sar–Minchin Dhap, 2600–3000 m; Helok, 1200–2500 m; Walunchung Gola–Zongi, 2700–3800 m, +*Sphaerotheciella sphaerocarpa*; Baroya Khimty–Thakma Khola, 2500–3000 m, +*Leptohymenium tenue*, +*Macrothamnium submacrocarpum*; Thakma Khola–Yamphodin, 2100–3300 m; Yamphodin–Ghatte, 1600–2100 m; Siling Tzokupa, 2000–3000 m, +*Ma-*

crothamnium macrocarpum, *Brachymenium* sp.; Birwa–Yektin, 1200–2500 m; Batasay–Bhuspate Danra, 2300–2600 m; Bhuspate Danra, 2600 m.

Distr. Himalaya, India, Ceylon, Burma, Yunnan, Indonesia, and Formosa.

This species, with many ecological forms, is extremely variable, particularly in regard to branching and papillosity of the leaf-cells. Some collections have many of the branches pinnate and obtuse, but in other tufts from the same station they are loose and flagelliform. Although the plants bearing flagelliform branches appear distinct, there are no constant characters by which this form can be separated from the typical one. The papillosity of leaf-cells varies considerably from one collection to another. In one collection a large papilla stands over each lumen of cells, but in another the papilla is small and frequently obscure. As seen from the synonyms listed by van Zanten (1959), this widely distributed species has been described by several different authors under different names. In a full series of collections there are all degrees of intergradation, so that it is difficult to draw any natural dividing line.

Duthiella formosana Nog. in Trans. Nat. Hist. Soc. Formosa **24**: 469 (1934).

Nepal: Iladanda–Selap, 1800–2600 m; Selap–Walunchung Gola, 2600–3200 m, +*Homaliodendron crassinervium*.

Distr. Himalaya, and Formosa. New to Himalaya.

Trachypodopsis auriculata (Mitt.) Fleisch. in Hedwigia **45**: 67 (1906).

Darjeeling: Ghum–Senchal, 2250 m; Senchal Lake–Tiger Hill, 2500 m, +*Calyptothecium hookeri*, +*Papillaria semitorta*; Takdah, 1600–1700 m; Sandakphu–Tonglu, 3550–2600 m; Darjeeling, 2000–2200 m; Tiger Hill, 2400–2800 m. Nepal: Bhankukay–Ghatte, 1600–2200 m; Siling Tzokupa, 2000–3000 m; Birwa–Yektin, 1200–2500 m, +*Trachypodopsis serrulata* var. *crispatula*; Bhuspate Danra, 2600 m, +*Trachypodopsis serrulata* var. *crispatula*; Bhuspate Danra–Mai Majuwa, 1600–2900 m; Baroya Khimty–Thakuma Khola, 2500–3000 m.

Distr. Nepal, Sikkim, Bhutan, Assam, Ceylon, Yunnan, Formosa, and Hawaii.

Trachypodopsis serrulata Fleisch. var. **crispatula** (Hook.) Zant. in Blumea **9**: 521 (1959).

Darjeeling: Victoria Fall, 1950 m, on rocks; Senchal Rest House–Ghum, 2400 2200 m; Tenzing Norkay Road–Birch Hill, 2000 m, on tree; Victoria Fall–St. Paul School, 2100 m; Kurseong, 1550 m; Senchal–Tiger Hill, 2500 m; Peschok–Lopchu, 1800 m; Batasi–Palmajua, 2300–2600 m, on shrubs; Batasi, +*Trachypus bicolor*, +*Penzigiella cordata*, +*Papillaria* spp.; Rimbick, 2200 m; Rimbick–Ramam, 1900–2400 m, on the base of shrubs; Sandakphu–Tonglu, 3550–2600 m. Sikkim: Pamianchi–Gayzing Bazar, 2000–1550 m, +*Floribundaria foribunda*, +*Neckera crenulata*; Preig Chu, below Bakkim, 2200 m, +*Papillaria semitorta*, +*Homaliodendron Montagneanum*; Jongri, 4000 m, among *Hymenophyllum* sp.; Jongri, 4200 m; Penlong La, near Gangtok, 2100 m, +*Floribundaria sparsa*, +*Aerobryidium filamentosum*, +*Papillaria semitorta*, +*Macrothamnium submarcocarpum*; Tendong Peak, 2900 m. Nepal: Bilbatay Bhanjang, 2200 m, +*Leptohymenium tenue*, +*Diaphanodon blandus*, +*Meteoriopsis squarrosa*; Bilbatay Bhanjang–Hati Sar, 2200–3000 m, +*Meteoriopsis squarrosa*; Hati Sar–Minchin Dhap, 2600–3000 m; Minchin Dhap–Mul Pokhari, 2400–2800 m, +*Aerobryidium filamentosum*; Mul Pokhari–Dumhan, 700–2400 m; Taplejung, 1700 m, +*Papillaria fuscescens*; Taplejung–Garhi Danra, 1700–2000 m; Helok, 1500 m; Iladanda–Selap, 1800–2600 m; Selap–Walunchung Gola, 2600–3200 m; Walunchung Gola–Zongi, 2700–3800 m, +*Diaphanodon* *blandus*, +*Floribundaria sparsa*; Zongi-Iladanda, 1800–2700 m, +*Struckia argentata*; Iladanda-Helok, 1500–1900 m, +*Entodon favescens*; Helok-Baroya Khimty, 1500–2500 m; Baroya Khimty-Thakma Khola, 2500–3000 m, Thakma Khola-Diorali Bhanjang-Yamphodin, 2100–3300 m, +*Trachypus bicolor*, +*Floribundaria sparsa* var. *pilifera*; Ghatte-Khebang, 1600–2200 m; Siling Tzokupa, 2000–3000 m; Changthaphu-Birwa, 1100–2100 m; Birwa-Yektin, 1200–2500 m; Yektin, 1100–2300 m; Batasay-Bhuspate Danra, 2300–2600 m, +*Papillaria semitorta*, +*Leptohymenium tenue*, +*Floribundaria sparsa*; Bhuspate Danra, 2600 m, +*Papillaria fuscescens*, +*P. semitorta*, +*Aerobryidium filamentosum*, +*Leptohymenium tenue*, +*Tayloria indica*; Bhuspate Danra-Mai Majuwa, 1600–2900 m, +*Trachypus bicolor*, +*Macrothamnium* sp.; Mai Pokhari, 1600 m, +*Neckera crenulata*; Mai Majuwa-Dhara Pani, 1500–1900 m, +*Papillaria semitorta*.

Distr. Himalaya, S. India, Burma, Andaman Isl., Yunnan, Szechuan, Laos, Indonesia, Philippines, Formosa, Halmahera, Mexico, and Guatemala.

var. **Guibertii** (Thér. et P. de la Vard.) Zant. in Blumea **9**: 527 (1959).

Darjeeling: Senchal, 2200–2400 m, +*Thuidium cymbifolium*.

Distr. Nepal, Sikkim, and Cambodia.

Trachypus bicolor Reinw. et Hornsch. in Nov. Act. Leop. Car. **14**: 2 suppl. 708 (1829).

Darjeeling: Batasi, 2150 m; Sandakphu-Tonglu, 3550–2600 m. Nepal: Taplejung, 1700 m, +*Thuidium cymbifolium*, +*Mnium confertidens*; Helok-Baroya Khimty, 1500–2500 m; Baroya Khimty-Thakma Khola, 2500–3000 m, +*Fissidens cristatus*, +*Porotrichum fruticosum*; Thakma Khola-Yamphodin, 2100–3300 m; Chyangthaphu-Birwa, 1100–2100 m; Birwa-Yektin, 1200–2500 m; Bhuspate Danra, 2600 m, +*Trachypodopsis serrulata* var. *crispatula*, +*Papillaria semitorta*.

Distr. Himalaya, Nilghiri, Madura, Ceylon, Thai, China, Formosa, Japan, Philippines, Indonesia, New Guinea, Fiji, and Hawaii.

PTEROBRYACEAE (by Akira Noguchi)

Calyptothecium Hookeri (Mitt.) Broth. in Engl., Pfl.-fam. I, **3**: 839 (1909)–Noguchi in Bot. Mag. Tokyo **78**: 63 (1965).

Darjeeling: Senchal Rest House-Ghum, 2400–2200 m, +*Trachypodopsis serrulata* var. *crispatula*; Senchal Lake-Tiger Hill, 2500 m. Sikkim: Jongri, 4000 m; Penlong La, near Gangtok, 2100 m, +*Barbella convolvens*. Nepal: Bilbatay Bhanjang-Hati Sar, 2200–3000 m; Mai Pokhari-Dumhan, 2400–700 m; Taplejung, 1700 m, +*Papillaria semitorta*, +*Trachypodopsis serrulata* var. *crispatula*; Bhuspate Danra, 2600 m, +*Trachypodopsis serrulata* var. *crispatula*; Selap-Walunchung Gola, 2600–3200 m; Mai Pokhari, 1500–1900 m.

Distr. Nepal, Sikkim, Khasia, Burma, Formosa, and Japan.

Calyptothecium pinnatum Nog. in Trans. Nat. Hist. Soc. Formosa **24**: 471 (1934); in Bot. Mag. Tokyo **78**: 64 (1965).

Sikkim: Yoksam, 1700 m.

Distr. Sikkim, Khasia, Burma, and Formosa.

Calyptothecium Wightii (Mitt.) Fleisch. in Hedwigia **45**: 62 (1906)–Nog. in Bot. Mag. Tokyo **78**: 65 (1965).

Nepal: Hati Sar-Minchin Dhap, 2600–3000 m.

Distr. Nepal, Burma, Yunnan, and Formosa.

Penzigiella cordata (Harv. ex Hook.) Fleisch. in Hedwigia **45**: 87 (1906).

Darjeeling: Batasi, 2150 m; Rimbick, 2200 m. Nepal: Selap–Walunchung Gola, 2600–3200 m, +*Homaliodendron crassinervium.*

Distr. Himalaya, Burma, and Thai.

Pterobryopsis divergens (Mitt.) Nog. in Journ. Hattori Bot. Lab. **28**: 147 (1965).

Darjeeling: Victoria Fall, 1950 m, on tree; Kurseong, 1550 m.

Distr. Sikkim, Khasia, and Burma.

Pterobryopsis flexipes (Mitt.) Fleisch. in Hedwigia **45**: 62 (1906). (?)

Nepal: Bhuspate Danra, 2600 m.

Distr. Nepal, India, and Ceylon.

Pterobryopsis Foulkesiana (Mitt.) Fleisch. in Hedwigia **45**: 60 (1906).

Darjeeling: Tenzing Norkay Road–Birch Hill, 2000 m; Darjeeling–Tiger Hill, 2150–2500 m, Sikkim: Yoksam, 1700 m; Pamianchi–Gayzing Bazar, 2000–1550 m; Gangtok, 1900 m.

Distr. Sikkim, and Nilghiri.

METEORIACEAE (by Akira Noguchi)

Aerobryidium filamentosum (Hook.) Fleisch. in Pfl.-fam. I, **3**: 821 (1906).

Aerobryum integrifolium Besch. in Ann. Sci. Nat. Bot. ser. 7, **15**: 74 (1892).

Aerobryopsis integrifolia (Besch.) Broth. in Pfl.-fam. I, **3**: 820 (1906).

Darjeeling: Tenzing Norkay Road–Birch Hill, 2000 m; Takdah, 1600–1700 m; Palmajua, on branches of shrubs; Palmajua-Rimbick, 2300–2200 m, on branches of trees; Rimbick, 2200 m, on branches of *Rhododendron vaccinioides* Hook. f.; Ramam, 2400 m; Phalut, 3550 m. Sikkim: Chia Bhanjang–Dentam, 3100–1450 m; Preig Chu, below Bakkim, 2200; Senchal, 2200–2400 m, +*Floribundaria aurea.* Nepal: Bilbatay Bhanjang–Hati Sar, 2200–3000 m; Hati Sar–Minchin Dhap, 2600–3000 m; Minchin Dhap–Mul Pokhari, 2400–2800 m; Iladanda–Selap, 1800–2600 m; Zongi–Iladanda, 1800–2700 m; Yamphodin–Ghatte, 1600–2100 m, +*Papillaria fuscescens*, +*Diaphanodon blandus*; Chyangthaphu–Birwa, 1100–2100 m; Birwa–Yektin, 1200–2500 m; Dhankuta, 1200 m; Batasay–Bhuspate Danra, 2300–2600 m.

Distr. Himalaya, India, Yunnan, and Szechuan.

Aerobryidium punctatum (C. Mull.) Dix. in Journ. Bot. **50**: 150 (1911). (?)

Nepal: Dhankuta, 1200 m.

Distr Himalaya, India, and Indonesia.

Aerobryum speciosum (Doz. et Molk.) Dozy et Molk. in Ned. Kruidk. Arch. **2** (4): 279 (1851).

Sikkim: Peshok–Lopchu, 1500 m; Pelong La, near Gangtok, 2100 m, +*Calyptothecium Hookeri.*

Distr. Himalaya, India, Ceylon, Tonkin, Laos, S. China, Indonesia, Philippines, Formosa, and Japan.

Barbella bombycina (Ren. et Card.) Fleisch. in Pfl.-fam. I, **3**: 824 (1906).

Darjeeling: Sandakphu–Tonglu, 3550–2600 m.

Distr. Himalaya, and India.

Barbella pendula (Sull.) Fleisch. in Musc. Fl. Buitenzorg **3**: 812 (1908). (?)

Darjeeling: Phalut–Sandakphu, 3200–3550 m; Nayathang–Phalut, on branches of *Rhododendron* sp.; Chia Bhanjang–Phalut, 3100–3550 m, on branches of *Rhododendron* sp. Nepal: Iladanda–Selap, 1800–2600 m; Siling Tzokupa, 2000–3000 m; Birwa-Yektin, 1200–2500 m; Bhuspate Danra, 2600 m.

Distr. SE. & E. Asia, and N. America.

The collections are all sterile and the plants are somewhat larger than those from Japan and similar to those of *B. asperifolia.* But the leaf-cells bear 2–3 papillae and the vegetative characters suggest that these collections represent merely a robust form of *B. pendula.* Therefore they are identified as *B. pendula.*

Barbella spiculata (Mitt.) Broth. in Pfl.-fam. I, **3**: 824 (1906).

B. questei Card. et Dix. in Rec. Bot. Surv. Ind. **6**: 82 (1914).

Darjeeling: Senchal Rest House–Ghum, 2400–2200 m. Sikkim: Yoksam, below Bakkim, 1700–2200 m, on branches of trees.

Distr. Himalaya.

Barbella Stevensii (Ren. et Card.) Fleisch. in Pfl.-fam. I, **3**: 824 (1906).

Sikkim: Chia Bhanjang–Dentam, 3100–1450 m, on *Skimmia arborescens*; below Bakkim-Jongri, 2500–4000 m, on branches of shrubs. Darjeeling: Phalut, 3550 m; Victoria Fall, 1950 m, on trees; Sandakphu–Tonglu, 3550–2600 m; Happy Valley, 2100 m; Senchal–Tiger Hill, 2500 m. Nepal: Hati Sar–Minchin Dhap, 2600–3000 m; Minchin Dhap–Mul Pokhari, 2400–2800 m; Baroya Khimty–Thakma Khola, 2500–3000 m; Siling Tzokupa, 2000–3000 m.

Distr. Himalaya, and Burma.

Barbella turgida Noguchi, sp. nov. [Fig. 38]

Planta robusta, atro-fusca superne lutescens, opaca. Caulis longe repens, densiuscule et complanate foliosus, densiuscule ramosus, ramis ca 1 cm longis simplicibus vel longioribus 7–8 cm longis, parce ramulosis, basi dense et complanate

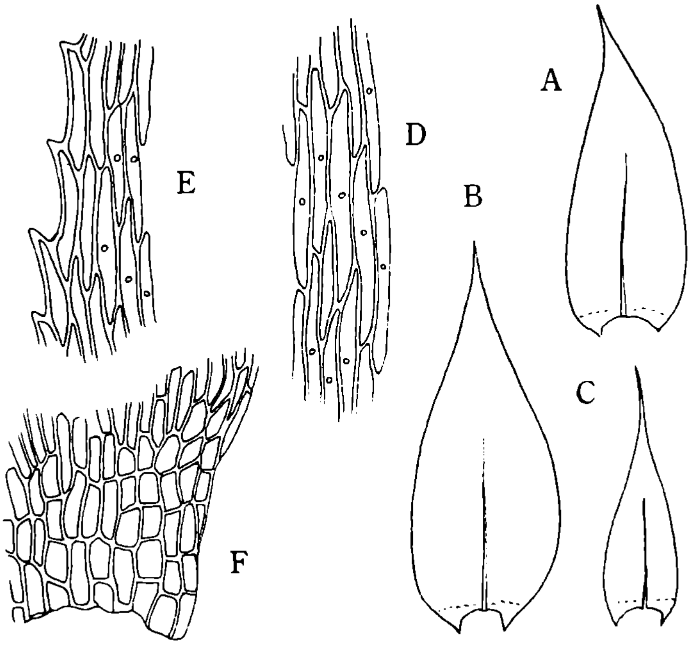

Fig. 38. *Barbella turgida* Noguchi

A. Stem-leaf, ×13. B. Branch-leaf, ×13. C. Leaf on apical part of branch, ×13. D. Cells from middle of leaf, ×333. E. Mid margin of leaf, ×333. F. Basal angle of leaf, ×167.

foliosis, superne filiformibus. Folia caulina divergentia, oblongo-ovata acuminata, ad 2.5×1 mm, folia ramea basilaria ovato-oblonga acuminata, ochracea, ad 3×1.5 mm, superiora ad 2×0.6 mm, lutescentia, costa tenui, simplici, ultra medium folii producta, marginibus serrulatis, cellulis unipapillatis, papillis minutis, parietibus tenuibus, medianis linearibus, 70–85×6–7 μ, superioribus plus minus brevioribus, insertionibus latioribus laxioribus, laevibus, parietibus crassioribus, alaribus laxioribus, rectangularibus.

Nepal: Baroya Khimty–Thakma Khola, 2500–3000 m (Kanai, Murata, and Togashi. Nov. 16, 1963, no. 236724—type in NICH, dupl. in TI).

This is distinguished from other members of the group bearing unicosta by its robust and turgid habits.

Chrysocladium flammeum (Mitt.) Fleisch. in Musc. Fl. Buitenzorg **3**: 830 (1908).

Darjeeling: Rimbick–Ramam, 1900–2400 m, on branches of shrubs; Ramam–Phalut, 2400–3500 m, on branches of shrubs; Sandakphu-Tonglu, 3550–2600 m. Sikkim: Jongri, 4000 m, on branches of shrubs. Nepal: Iladanda–Selap, 1800–2600 m; Helok, 2600 m; Thakma Khola–Yamphodin, 2100–3300 m; Siling Tzokupa, 2000–3000 m.

Distr. Himalaya.

I have some questions on the systematic position that this species occupies. The correlation between this species and its allies hopefully will be cleared up by a thorough study in near future.

Chrysocladium phaeum (Mitt.) Fleisch. in Musc. Fl. Buitenzorg **3**: 830 (1908).

Darjeeling: Darjeeling, 2200 m; Senchal–Tiger Hill, 2500 m, +*Diaphanodon blandus*; Phalut–Sandakphu, 3200–3550 m; Sandakphu–Tonglu, 3500–2600 m; Ghum, 2000 m; Happy Valley, 2100 m. Nepal: Hati Sar–Minchin Dhap, 2600–3000 m; Siling Tzokupa, 2000–3000 m; Birwa–Yektin, 1200–2500 m; Bhuspate Danra, 2600 m.

Distr. Himalaya, India, Indo-China, and Formosa.

Floribundaria aurea (Mitt.) Broth. in Engl., Pfl.-fam. I, **3**: 822 (1906).

Darjeeling: Ghum–Senchal, 2250 m; Senchal–Tiger Hill, 2500 m; Rimbick, 2200 m; Sandakphu–Tonglu, 3550–2600 m, +*Fleischerobryum longicolle*; Happy Valley, 2100 m. Nepal: Hati Sar–Minchin Dhap, 2600–3000 m; Iladanda–Selap, 1800–2600 m, +*Papillaria fuscescens*; Yamphodin–Ghatte, 1600–2100 m; Baroya Khimty–Thakma Khola, 2500–3000 m; Siling Tzokupa, 2000–3000 m; Birwa–Yektin, 1200–2500 m; Bhuspate Danra, 2600 m.

Distr. Himalaya, India, Burma, Tonkin, Laos, Indonesia, Philippines, and Formosa.

Floribundaria floribunda (Doz. et Molk.) Fleisch. in Hedwigia **44**: 302 (1905).

Darjeeling: Victoria Fall, 1950 m. Sikkim: Pamianchi–Gayzing Bazar, 2000–1550 m. Nepal: Iladanda–Selap, 1800–2600 m; Baroya Khimty–Thakma Khola, 2500–3000 m.

Distr. Widely distributed in Africa, Asia, Australia and Oceania.

Floribundaria sparsa (Mitt.) Broth. in Pfl.-fam. I, **3**: 822 (1906).

Darjeeling: Darjeeling, 2000–2200 m; Phalut, 3550 m; Birch Hill, 2000 m. Sikkim:

Dentam–Pamianchi, 2000 m, on branches of trees; Yoksam, 1700 m. Nepal: Selap–Walunchung Gola, 2600–3200 m; Baroya Khimty–Thakma Khola, 2500–3000 m; Yamphodin–Ghatte, 1600–2100 m; near Chyangthaphu–Birwa, 1100–2100 m; Bhuspate Danra, 2600 m.

Distr. Himalaya, India, and Formosa.

var. **pilifera** (Nog.) Noguchi in Journ. Hattori Bot. Lab. **28**: 151 (1965).

Darjeeling: Darjeeling, 2000–2200 m; Senchal–Tiger Hill, 2550 m; Rimbick, 2100 m, on branches of trees; Sandakphu–Tonglu, 3550–2600 m. Nepal: Bilbatay Bhanjang–Hati Sar, 2200–3000 m; Minchin Dhap–Mul Pokhari, 2400–2800 m; +*Papillaria fuscescens*; Taplejung, 2000 m; Yamphodin–Ghatte, 1600–2100 m; Birwa–Yektin, 1200–2500 m, +*Floribundaria aurea*; Batasay–Bhuspate Danra, 2300–2600 m; Bhuspate Danra–Mai Majuwa, 1600–2900 m.

Distr. Himalaya, and India.

Meteoriopsis reclinata (C. Mull.) Fleisch. in Engl., Pfl.-fam. I, **3**: 826 (1906).

Darjeeling: Phalut, 3550 m; Lopchu, 1500 m. Nepal: Iladanda–Selap, 1800–2600 m; Baroya Khimty–Thakma Khola, 2500–3000 m, +*Papillaria fuscescens*, +*Floribundaria floribunda*; Bhuspate Danra–Mai Majuwa, 1600–2900 m.

Distr. Himalaya, India, Ceylon, Burma, Laos, Yunnan, Kweichow, Szechuan, Indonesia, Philippines, Formosa, Japan, and Australia.

This species varies greatly in the size of plants, in the foliation, and in the form of leaves. In normal cases, for example, the leaves are strongly recurved, but on certain parts of stems they are widely spreading and hardly recurved.

Meteoriopsis squarrosa (Hook.) Fleisch. in Engl., Pfl.-fam. I, **3**: 826 (1906).

Darjeeling: Victoria Fall, 1950 m, on tree, +*Floribundaria sparsa*; Batasi, 2150 m; Senchal, 2400 m. Sikkim: Gangtok, 1900 m. Nepal: Bilbatay Bhanjang, 2200 m, +*Aerobryidium filamentosum*; Bilbatay Bhanjang–Hati Sar, 2200–3000 m; Hati Sar–Minchin Dhap, 2600–3000 m; Minchin Dhap–Mul Pokhari, 2400–2800 m; Yektin, 1100–2300 m; Bhuspate Danra–Mai Majuwa, 1600–2900 m; Mai Pokhari, 1500–1900 m.

Distr. Himalaya, India, Ceylon, Indo-China, Indonesia, Philippines, Yunnan, and Formosa.

Meteorium Buchanani (Brid.) Broth. in Pfl.-fam. I, **3**: 818 (1906).

Nepal: Bilbatay Bhanjang, 2200 m, +*Aerobryidium filamentosum*; Bilbatay Bhanjang–Hati Sar, 2200–3000 m; Hati Sar–Minchin Dhap, 2600–3000 m; Minchin Dhap–Mul Pokhari, 2400–2800 m, +*Floribundaria sparsa* var. *pilifera*; Yektin, 1100–2300 m.

Distr. Himalaya, India, and Yunnan.

Meteorium helminthocladum (C. Mull.) Fleisch., Musc. Fl. Buitenz. **3**: 778 (1908).

Darjeeling: Phalut, 3550 m, +*Trachypodopsis serrulata* var. *crispatula*, +*Aerobryidium filamentosum*, +*Papillaria fuscescens*. Nepal: Bilbatay Bhanjang, 2200 m; Bilbatay Bhanjang–Hati Sar, 2200–3000 m; Minchin Dhap–Mul Pokhari, 2400–2800 m, +*Aerobryidium filamentosum*; Iladanda–Selap, 1800–2600 m; Selap–Walunchung Gola, 2600–3200 m, +*Floribundaria sparsa* var. *pilifera*; Zongi–Iladanda, 1900–2700 m; Helok–Baroya Khimty, 1500–2500 m; Chyanghaphu–Birwa, 1100–2100 m; Bhuspate Danra, 2600 m, +*Aerobryidium filamentosum*, +*Papillaria fuscescens*, +*Chrysocladium phaeum*.

Distr. Himalaya, India, Ceylon, Indo-China, Yunnan, Indonesia, Philippines, Formosa, and Japan.

Papillaria fuscescens (Hook.) Jaeg., Adumb. **2**: 174 (1879).

Darjeeling: Victoria Fall, 1950 m, on branches of shrubs; Takdah, 1600–1700 m, +*Papillaria semitorta*; Batasi–Palmajua, 2500–2150 m, on branches of shrubs; Rimbick, 2100 m, on branches of shrubs; Rimbick–Ramam, 1900–2400 m, on branches of *Berberis*; Sandakphu–Tonglu, 3550–2600 m, on branches of shrubs; Kurseong, 1550 m, +*Papillaria semitorta.* Sikkim: Gangtok, 1900 m; Jongri, 4000 m, on branches of shrubs. Nepal: Bilbatay Bhanjang, 2200 m, +*Trachypodopsis serrulata* var. *crispatula*, +*Meteorium helminthocladum*; Bilbatay Bhanjang–Hati Sar, 2200–3000 m, +*Cleistostoma ambiguum*; Hati Sar–Minchin Dhap, 2600–3000 m; Minchin Dhap–Mul Pokhari, 2400–2800 m, +*Floribundaria sparsa* var. *pilifera*, +*Meteorium helminthocladum*; Taplejung-Garhi Danra, 1700–2000 m; Tuwa–Taplethok, 1300–1600 m; Iladanda–Selap, 1800–2600 m; Baroya Khimty–Thakma Khola, 2500–3000 m; Yamphodin–Ghatte, 1600–2100 m; Siling Tzokupa 2000–3000 m; Chyangthaphu–Birwa, 1100–2100 m; Birwa-Yektin, 1200–2500 m; Batasay–Bhuspate Danra, 2300–2600 m, +*Floribundaria sparsa*; Bhuspate Danra–Mai Majuwa, 1600–2900 m; Mai Majuwa–Dhara Pani, 1500–1900 m.

Distr. Himalaya, Nilghiri, Ceylon, Laos, Thai, Yunnan, and Philippines.

The leaf-acumens of some collections are longer than usual, thus affording a piliferous appearance, but no outstanding character was observed, which could be used in separating these forms from the species.

Papillaria semitorta (C. Mull.) Jaeg., Adumb. **2**: 175 (1879).

Nemerous collections from Darjeeling district and from East Nepal.

Distr. Himalaya, Ceylon, Yunnan, Indonesia, Philippines, and Formosa.

This seems to be one of the most common mosses in Eastern Himalaya. The collections are not uniform. The collections from Darjeeling, Tuwa–Taplethok, and Bhuspate Danra are more robust than usual and thus have a general appearance differing somewhat from that of *P. semitorta.* In the absence of any other well-marked differences, however, it seems probable that this is nothing more than a robust form of the species.

Pseudobarbella compressiramea (Ren. et Card.) Noguchi, comb. nov.

Meteorium compressirameum Ren. et Card. in Bull. Soc. Bot. Belg. **38**: 27 (1900).

Aerobryopsis denticulata Dixon in Journ. Bombay Nat. Hist. Soc. **39**: 783 (1937).

Darjeeling: Darjeeling, on branches of *Dichroa* sp.; Victoria Fall, 1950 m, on ferns; Senchal Rest House–Ghum, 2300 m, on trees; Takdah, 1600 m, on branches of trees; Batasi, 2150 m; Ghum–Tiger Hill, 2300–2500 m. Nepal: Bhuspate Danra–Mai Majuwa, 2800–1600 m; Mai Pokhari, 1500–1900 m.

Distr. Himalaya.

NECKERACEAE (by Akira Noguchi)

Cryptoleptodon flexuosus (Harv.) Ren. et Card. in Bull. Soc. Bot. Belg. **38**: 50 (1900).

Nepal: Selap–Walunchung Gola, 2600–3200 m.

Distr. Pakistan, N. W. Himalaya, and Nepal.

Handeliobryum setschwanicum Broth. in Sitzungsber. Akad. Wiss. Wien Math. Nat. Kl. **133**: 575 (1924).

Nepal: Bhuspate Danra, 2600 m.

Distr. E. Nepal, and Szechuan.

Homaliodendron crassinervium Thér. in Recueil Publ. Soc. Havraise, Etud. Div. **1919**: 39 (1919).

Nepal: Selap–Walunchung Gola, 2600–3200 m, +*Penzigiella cordata.*

Distr. Himalaya, and Vietnam.

Homaliodendron ligulaefolium (Mitt.) Fleisch. in Hedwigia **45**: 77 (1906).

Darjeeling: Tenzing Norkay Road–Birch Hill, 2000 m, on trees; Senchal–Tiger Hill, 2500 m; Phalut, 3550 m; Sandakphu–Tonglu, 3550–2600 m. Sikkim: below Bakkim–Jongri, 4000 m, on *Hymenophyllum* sp.

Distr. Himalaya, Ceylon, Sumatra, Philippines, Formosa, New Guinea, and New Caledonia.

Homaliodendron microdendron (Mont.) Fleisch. in Hedwigia **45**: 78 (1906).

Nepal: Selap–Walunchung Gola, 2600–3200 m; Helok, 1500 m.

Distr. Himalaya, Burma, Thai, Yunnan, Borneo, Philippines, Formosa, and Ryukyu.

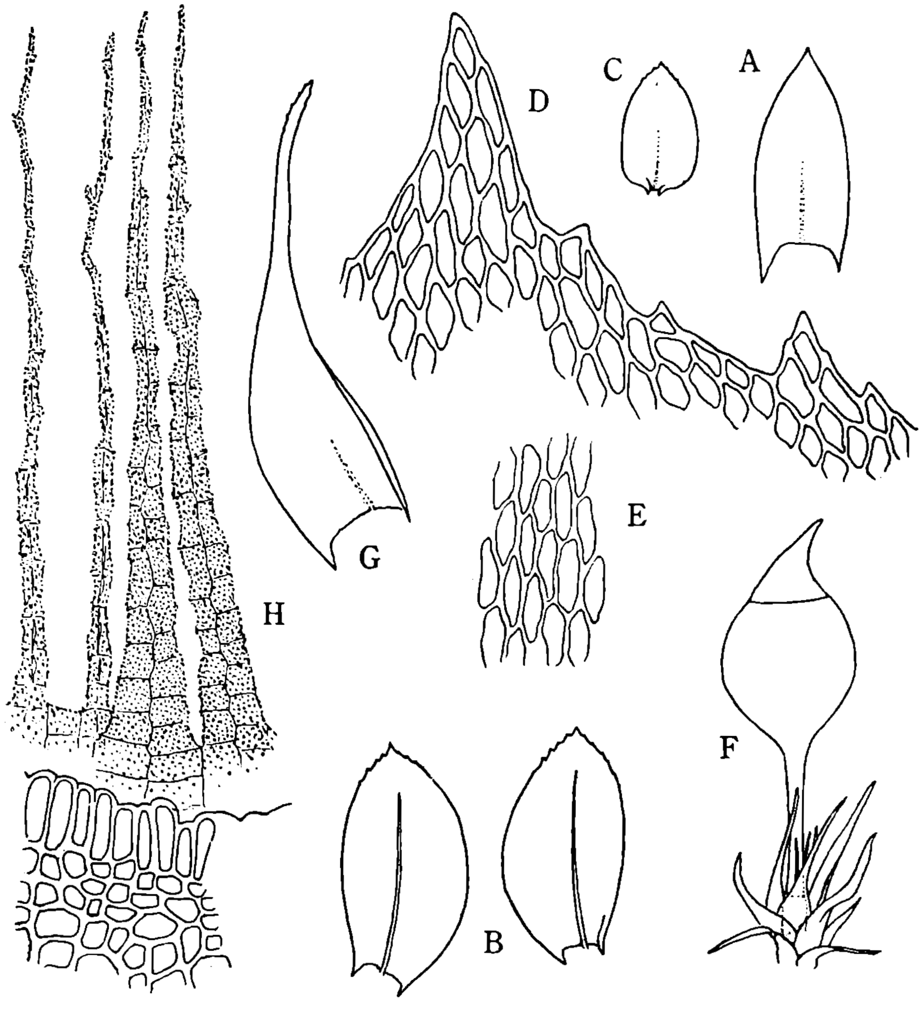

Fig. 39. *Homaliodendron sphaerocarpum* Noguchi
A. Leaf of stipes, ×13. B. Leaves of stem, ×13. C. Branch-leaf, ×13. D. Apical part of stem-leaf, ×333. E. Cells from middle of stem-leaf, ×333. F. Sporophyte, ×10. G. Inner perichaetial bract, ×27. H. Peristome, ×180.

Homaliodendron montagneanum (C. Mull.) Fleisch. in Hedwigia **45**: 74 (1906).

Darjeeling: Senchal Rest House–Ghum, 2400–2200 m on trees; Ramam, 2400 m; Sandakphu–Tonglu, 3550–2600 m. Sikkim: Jongri, 4000 m, on *Hymenophyllum* sp.; Migothang–Nayathang, 3300 m; Penlong La, near Gangtok, 2100 m. Nepal: Selap–Walunchung Gola, 2600–3200 m; Walunchung Gola–Zongi, 2700–3800 m; Zongi–Iladanda, 1800–2700 m; Yamphodin–Ghatte, 1600–2100 m; Bhuspate Danra, 2600 m, +*Trachypodopsis serrulata* var. *crispatula*.

Distr. Himalaya, Java, and S. China.

Homaliodendron rectifolium (Mitt.) Fleisch. in Hedwigia **45**: 75 (1906).

Sikkim: Penlong La, near Gangtok, 2100 m. Nepal: Selap–Walunchung Gola, 2600–3200 m.

Distr. Himalaya.

Homaliodendron scalpellifolium (Mitt.) Fleisch. in Hedwigia **45**: 75 (1906).

Darjeeling: Peshok–Lopchu, 1500 m; Lopchu, 1500 m.

Distr. Sikkim, Ceylon, Sumatra, Celebes, Thai, Tonkin, S. China, Formosa, and Japan.

Homaliodendron sphaerocarpum Noguchi, sp. nov. [Fig. 39]

Dioicum. Planta lutescenti-viridis, nitidiuscula, frondibus ovato-oblongis vel ovatis. Caulis primarius longe repens, caules secundarii erecti, densiuscule et complanate foliosi, sicco plus minus curvati, ad 7 cm longi, dense pinnatim ramosi, stipite 2–4 cm longo, remote folioso, ramis complanate patentibus, sicco curvatis, ca 1 cm longis, dense foliosis, laxe vel dense ramulosis, apice longe attenuatis vel flagellatis. Folia stipitatis remote imbricata, ovato-oblonga acuta, integra, ad 2×0.8 mm, costa tenui. Folia caulina complanata, late ovata vel oblongo-ovata obtusa, basi decurrentia, ad 2×1 mm, marginibus superne dentatis, costa simplici longe infra apicem folii evanida, cellulis medianis oblongis, 20–25×7–9 μ in diam., parietibus potius tenuibus, superioribus brevioribus latioribus, inferioribus longioribus sublinearibus. Folia ramea late ovata apice obtusa, ad 1×0.7 mm. Perichaetia in caulibus secundariis oriunda, bracteae internae oblongo-vaginulatae, subulatum attenuatae, apice dentatae, ad 2 mm longae, costa tenui, paraphysibus paucis. Seta ca 1.3 mm longa, lutescens, laevis. Theca globosa, ca 1.3 mm crassa, lutescenti-fusca. Peristomium pallidum, exostomii dentes lineari-lanceolati, ad 0.5 mm longi, dense papillosi, endostomii membrana humilis, processus filiformes, papillosi, cilia nulla. Sporae globosae, 17–25 μ in diam., indistincte papillosae, lutescenti-fuscae. Operculum conicum oblique rostratum, ca 0.8 mm altum.

Darjeeling: Batasi, 2150 m, (Hara, Kanai, Murata, Togashi, and Tuyama, May 6, 1960, no. 200582—type in NICH, dulp. in TI).

The branches recurved when dry and the globose capsules are characteristic of this species.

Neckera crenulata Harv. in Hook., Icon. Pl. **1**: t. 21 (1836)–Nog. in Journ. Hattori Bot. Lab. **28**: 154 (1965).

N. luzonensis Williams in Bull. New York Bot. Gard. **8**: 358 (1914).

Sikkim: Peshok–Lopchu, 1800 m; Pamianchi–Gayzing Bazar, 2000–1550 m; Yoksam, 1700 m; Penlong La, near Gangtok, 2100 m. Nepal: Hati Sar–Minchin Dhap, 2600–3000 m; Selap–Walunchung Gola, 2600–3200 m; Walunchung Gola–Zongi, 2700–3800 m; Bhuspate Danra, 2600 m.

Distr. Himalaya, Burma, Yunnan, Philippines, and Formosa.

Neckera himalayana Mitt. in Journ. Linn. Soc. Suppl. **1**: 121 (1859).

Sikkim: Penlong La, near Gangtok, 2100 m; Lower Road between Rabong La and Temi, 1000–1300 m, +*Trachypodopsis serrulata* var. *crispatula*. Nepal: Birwa–Yektin, 1200–2500 m; Mai Pokhari, 1500–1900 m.

Distr. Himalaya, Ceylon, and Burma.

This species exhibits rather little variation, but has been described under several names. *Neckera longe-exserta* has already been reduced to a synonymy of *N. himalayana* by Dixon (1937). From the examination of many specimens of *Neckera birmensis* Hampe determined by Mitten and Brotherus, I cannot avoid the opinion that it is merely a form of *N. himalayana*. The usual diagnostic characters of these species, such as the shape of leaves, have only a relative value and seem to be of minor importance.

Neckera setschwanica Broth. in Sitzungsber. Ak. Wiss. Wien Math. Nat. Kl. Abt. 1. **131**; 215 (1923).

Sikkim: Jongri, 4000 m.

Distr. Sikkim, and Szechuan. New to E. Himalaya.

I could not see that the collections differ essentially from the type specimen from Setschwan austro-occidental in Brotherus' Iter Sinense, no. 1995, except that the leaf-costa is usually short.

Porotrichum fruticosum (Mitt.) Jaeg., Adumb. **2**: 210 (1875).

Darjeeling: Senchal–Tiger Hill, 2500 m; Sandakphu–Tonglu, 3550–2600 m. Nepal: Baroya Khimty–Thakma Khola, 2500–3000 m; Thakma Khola–Yamphodin, 2100–3300 m; Yamphodin–Ghatte, 1600–2100 m; Bhuspate Danra, 2600 m.

Distr. Himalaya.

HOOKERIACEAE (by Akira Noguchi)

Distichophyllum obovatum (Griff.) Par., Ind. Bryol. 390 (1896).

Darjeeling: Takdah, 1600–1700 m.

Distr. Himalaya.

Orontobryum Hookeri (Mitt.) Fleisch. in Engl., Pfl.-fam. ed. 2, **11**: 261 (1925). (det. Norkett)

Sikkim: Migothang, 3900 m.

Distr. Sikkim.

HYPOPTERYGIACEAE (by Akira Noguchi)

Cyathophorella adianthum (Griff.) Fleisch. in Musc. Fl. Buitenz. **3**: 1094 (1908).

Sikkim: Tingling Bridge–Yoksam, 1700 m, on *Hymenophyllum* sp.

Distr. Himalaya, and Philippines.

Cyathophorella intermedia (Mitt.) Broth. in Pfl.-fam. ed. 2, **11**: 277 (1925).

Darjeeling: Senchal–Tiger Hill, 2500 m. Nepal: Helok–Baroya Khimty, 1500–2500 m, on the trunks of bamboo; Baroya Khimty–Thakma Khola, 2500–3000 m, on branches of tree.

Distr. Himalaya, Philippines, Formosa, and Japan.

The leaf-areolation is more loose than usual and the marginal borders of the amphigastria are not distinct.

FABRONIACEAE (by Akira Noguchi)

Fabronia cf. **schensiana** C. Mull. in Nuov. Giorn. Bot. Ital. **4**: 262 (1897).

Nepal: Dhankuta, 1200 m.

Distr. Nepal, and China (Shensi, Szechuan). New to Himalaya.

This is similar to *F. curvirostris* Doz. et Molk. from Java and the Philippines, but is much smaller, and the branch-leaves are broader being ovate in form.

Schwetschkeopsis formosana Nog. in Journ. Hattori Bot. Lab. **5**: 41 (1951).

Nepal: Bilbatay Bhanjang, 2200 m.

Distr. Nepal, and Formosa.

LESKEACEAE (by Akira Noguchi)

Lindbergia cf. **Koelzii** Williams in Bryologist **35**: 3 (1932).

Nepal: Selap–Walunchung Gola, 2600–3200 m, on twigs.

Distr. Himalaya.

Rhegmatodon declinatus (Hook.) Brid., Bryol. Univ. **2**: 204 (1827).

Sikkim: Yoksam, 1700 m.

Distr. Himalaya, Burma, Kweichow, and Formosa.

Rhegmatodon polycarpus (Griff.) Mitt. in Journ. Linn. Soc. Suppl. **1**: 127 (1859). (?)

Nepal: Yamphodin–Ghatte, 1600–2100 m.

Distr. Himalaya, Kweichow, and Yunnan.

THUIDIACEAE (by Akira Noguchi)

Actionothuidium Hookeri (Mitt.) Broth. in Engl., Pfl.-fam. I, **3**: 1020 (1908).

Darjeeling: Sandakphu–Tonglu, 3550–2000 m, on the basal parts and branches of shrubs. Sikkim: Gamothang, 3900 m. Nepal: Hati Sar–Minchin Dhap, 2600–3000 m; Minchin Dhap–Mul Pokhari, 2400–2800 m; Taplejung, 1700 m; Helok–Baroya Khimty, 1500–2500 m; Baroya Khimty–Thakma Khola, 2500–3000 m.

Distr. Himalaya, Burma, Yunnan, and Formosa.

Anomodon minor (Hedw.) Fuernr. subsp. **integerrimus** (Mitt.) Iwats. in Journ. Hattori Bot. Lab. **26**: 41 (1963).

Nepal: Taplejung–Garhi Danra, 1700–2000 m.

Distr. Himalaya, Burma, China, E. Siberia, Korea, and Japan.

Anomodon Rugelii (C. Mull.) Keissl. in Ann. Naturh. Hofmus. Wien **15**: 214 (1900).

Sikkim: Yoksam, 1700 m.

Distr. Northern Hemisphere.

Claopodium nervosum (Harv.) Fleisch. in Musc. Fl. Buitenz. **4**: 1504 (1922)–Nog. in Journ. Hattori Bot. Lab. **27**: 34 (1964).

Darjeeling: Palmajua–Rimbick, 2300–2200 m, on *Hymenophyllum* sp.

Distr. Himalaya, India, E. China, Formosa, Japan, Indonesia, Oceania, and Hawaii.

Thuidium brachymenium Herz. in Hedwigia **65**: 164 (1925).

Nepal: Bilbatay Bhanjang–Hati Sar, 2200–3000 m; Taplejung, 1700 m; Selap–Walunchung Gola, 2600–3200 m; Walunchung Gola–Zongi, 3200–3800 m; Zongi, 2600 m; Helok–Baroya Khimty, 1500–2500 m, +*Diaphanodon blandus*; Baroya Khimty–Thakma Khola, 2500–3000 m; Thakma Khola–Yamphodin, 2100–3300 m; Yamphodin–Ghatte, 1600–2100 m; Siling Tzokupa, 2000–3000 m; Batasay–Bhuspate Danra, 2300–2600 m.

Distr. Nepal, and Yunnan.

Thuidium cymbifolium (Dozy et Molk.) Dozy et Molk., Bryol. Jav. **2**: 115 (1865).

Numerous collections were made from Sikkim and eastern Nepal.

Distr. Asiatic tropical and subtropical regions.

Thuidium glaucinum (Mitt.) Bosch et Lac., Bryol. Jav. **2**: 117 (1865).

Nepal: Bilbatay Bhanjang, 2200 m; Siling Tzokupa, 2000–3000 m.

Distr. Asiatic tropical and subtropical regions.

Thuidium Tamariscellum (Mitt.) Bosch et Lac., Bryol. Jav. **2**: 120 (1865).

Sikkim: Gangtok, 1900 m; Pamianchi–Gayzing Bazar, 1550–2000 m.

Distr. Himalaya, India, Burma, Tonkin, Yunnan, Hunan, Indonesia, and Philippines.

AMBLYSTEGIACEAE (by Akira Noguchi)

Campylium Halleri (Hedw.) Lindb., Musc. Scand. 38 (1879).

Darjeeling: Phalut–Sandakphu, 3200–3550 m. Sikkim: Migothang–Nayathang, 3900–3300 m.

Distr. Himalaya, China, and N. America.

Drepanocladus exannulatus (B. S. G.) Warnst. in Beih. Bot. Centr. **13**: 405 (1903). (?)

Nepal: Siling Tzokupa, 2000–3000 m.

Distr. Northern Hemisphere.

BRACHYTHECIACEAE (by Noriwo Takaki)

Brachythecium Buchanani (Hook.) Jaeg. in Ber. Sci. Gall. Naturw. Ges. **1876–77**: 341 (1878).

Nepal: Mai Pokhari 1500–1900 m; Bhuspate Danra–Mai Majuwa, 1600–2900 m. Sikkim: Yoksam, 1700 m.

Distr. Himalaya (Nepal to Bhutan), Assam, S. India, Thai, Viet-Nam, Laos, Burma, Philippines, China, Korea, and Japan.

Brachythecium formosanum Takaki in Journ. Hattori Bot. Lab. **15**: 2 (1955).

Nepal: Walunchung Gola–Zongi, 2700–3800 m.

Distr. Nepal, and Formosa. New to Nepal.

This species resembles *Chamberlainia* species in many respects, but differs in its smaller habit and in having well developed cilia of peristome. The Nepal specimen agrees well with the type specimen from Formosa in both sporophytic and gametophytic characters mentioned in the original description. This collection shows a remarkable extension in the range of this species.

Brachythecium plumosum (Hedw.) B.S.G., Bryol. Eur. **6**: 8 (1853).

Nepal: Taplejung, 1700 m; Yamphodin-Ghatte, 1600–2100 m, +*B. Buchanani*; Bhandukay-Ghatte, 1600–2200 m; Baroya Khimty-Thakma Khola, 2500–3000 m, +*Symblepharis Reinwardtii*; Bhuspate Danra, 2600 m; Thakma Khola-Yamphodin, 2100–3300 m. Sikkim: Pamianchi, 2000 m; Jongri, 4000 m.

Distr. Spitzbergen, Madeira, Algeria, Europe, Caucasus, Kashmir, Himalaya, Khasia, Ceylon, Java, China, Korea, Formosa, Japan, Saghalin, New Zealand, and N. America.

This seems to be one of the common mosses in the present regions.

Brachythecium populeum (Hedw.) B.S.G., Bryol. Eur. **6**: 7 (1853).

Nepal: Selap–Walunchung Gola, 2600–3200 m.

var. **longisetum** B.S.G., Bryol. Eur. **6**: 7 (1853).

Nepal: below Siling Tzokupa–Siling Tzokupa, 2000–3000 m.

Distr. sp. Europe, Caucasus, Kashmir, Nepal, Korea, Japan, Siberia, and N. America. New to Nepal.

Brachythecium rivulare B.S.G., Bryol. Eur. **6**: 17 (1853).

Sikkim: Preig Chu, below Bakkim, 2200 m.

Distr. Europe, Turkestan, Caucasus, Madeira, Kashmir, Himalaya, Formosa, Japan, N. Asia, and N. America,

Brachythecium rutabulum (Hedw.) B.S.G., Bryol. Eur. **6**: 15 (1853).

Nepal: Thakma Khola–Yamphodin, 2100–3300 m.

Distr. Europe, Algeria, Caucasus, Syria, Persia, Himalaya, Siberia, Japan, Fiji, N. America, S. America, and Tasmania.

Brachythecium salebrosum (Web. et Mohr) B.S.G., Bryol. Eur. **6**: 20 (1853).

Nepal: Kathmandu Airport, 1400 m.

Distr. Europe, Morocco, Algeria, Kashmir, Himalaya, Tibet, Amur, Siberia, Saghalin, Japan, N. America, Azores, Canarias, and Tasmania.

Brachythecium Wichurae (Broth.) Par., Ind. Bryol. Suppl. 52 (1900).

Nepal: Taplejung–Garhi Danra, 1700–2000 m.

Distr. Nepal, Yunnan, and Japan. New to Himalaya.

Bryhnia novae-angliae (Sull. et Lesq.) Grout in Bull. Torr. Bot. Cl. **25**: 229 (1898).

Darjeeling: Ghum–Senchal, 2250 m; Phalut, 3550 m.

Distr. Europe, N. America, and Japan. New to Himalaya.

Eurhynchium cf. **dumosum** (Mitt.) Jaeg.

Nepal: Bilbatay Bhanjang, 2200 m.

Distr. Nepal, Sikkim, and Assam.

This specimen resembles *E. arbusculum* especially in having somewhat dendroid habit and strongly papillose setae, but differs in the leaves having less plication, larger cells and slight serration on margins.

Eurhynchium praelongum (Hedw.) B.S.G., Bryol. Eur. **5**: 224 (1854).

Sikkim: Tendong Peak, 2700 m. Darjeeling: Sandakphu–Tonglu, 3500–2600 m.

Distr. Europe, Algeria, Caucasus, Kurdistan, Sikkim, Siberia, Japan, N. America, S. America, Azores, Saint Helena. New to Himalaya.

Eurhynchium riparioides (Hedw.) Richs. in Ann. Bryol. **9**: 135 (1937).

Nepal: Baroya Khimty–Thakma Khola, 2500–3000 m; Bhuspate Danra–Mai

Majuwa, 1600–2900 m.

Distr. Europe, Morocco, Algeria, Caucasus, Sinai, Luristan, Himalaya, Yunnan, Szechuan, Manchuria, Japan, N. America, and Canarias.

Rhynchostegiella ramicola (Broth.) Broth. in Pfl.-fam. ed. 2, **11**: 376 (1925).

Darjeeling: Darjeeling, 2000–2200 m; Victoria Fall, 1950 m.

Distr. Sikkim.

Growing on the branches of *Berberis* sp., with young sporophytes having strongly scabrous setae.

Rhynchostegiella cf. **scabriseta** (Schwaegr.) Broth.

Sikkim: Jongri, 4000 m.

Distr. Sikkim, and Assam.

Delicate, soft and light yellowish-green plant. Growing on branches. Leaves spreading-flexuose when dry; leaf margins serrate all around; costa thin extending 2/3 length of leaf; leaf cells linear. Seta slender, up to 2 cm long, strongly scabrous throughout.

Rhynchostegium vagans (Harv.) Jaeg., Ad. **2**: 435 (1877–78).

Nepal: Yamphodin–Ghatte, 1600–2100 m.

Distr. Nepal, Sikkim, S. India, Ceylon, Laos, Thai, Java, Ceram, Borneo, Formosa, and Hawaii.

ENTODONTACEAE (by Urara Mizushima)

Campylodontium flavescens (Hook.) Bosch et Lac., Bryol. Jav. **2**: 128 (1865)–Fleisch., Musc. Fl. Buitenz. **4**: 1150, f. 192 (1915).

Pterogonium flavescens Hook., Musc. Exot. **2**: 155, t. 155 (1819)–Griff., Icon. Pl. Asia. 2, t. 98, IV (1849).

Pterigynandrum flavescens Brid., Bryol. Univ. **2**: 193 (1827).

Campylodontium striatum Doz. et Molk., Musc. Archip. Indic. 123, t. 39 (1844).

Fabronia striata C. Muell., Synop. **2**: 39 (1850).

Neckera flavescens C. Muell., l.c. 68 (1850).

Stereodon flavescens Mitt. in Journ. Linn. Soc. Suppl. **1**: 93 (1859).

C. Nepal: Kathmandu Airport (Oct. 13, 1963, fr.). Nepal: Dhankuta, 1200 m (Oct. 21, 1963, young fr.); Bilbatay Bhanjang–Hati Sar, 2200–3000 m (Oct. 27, 1963, fr.); Taplejung–Garhi Danra, 1700–2000 m (Nov. 3, 1963, fr.).

Distr. E. Himalaya (Nepal, Sikkim), C. India (Mysore), Ceylon, Assam, Burma, Annan, Malacca, Sumatra, Java, Celebes, Philippines, and Queensland.

Entodon cf. **angustifolius** (Mitt.) Jaeg. et Sauerb. in Ber. Sci. Gall. Naturw. Ges. **1876–77**: 287 (1879)–U. Mizushima in Journ. Hattori Bot. Lab. **22**: 106, f. 3 (1960).

Stereodon angustifolius Mitt. in Journ. Linn. Soc. Suppl. **1**: 106 (1859).

Nepal: Iladanda–Selap, 1800–2600 m (Nov. 9, 1963).

Distr. E. Himalaya (Nepal, Sikkim), N. Burma, Laos, Tonkin, China (Hunan, Kiangsu and Yunnan), and Japan.

Entodon chloropus Ren. et Card. in Bull. Soc. Bot. Belg. **38**(1): 34 (1900). [Fig. 40]

E. Nepal: Near Chyangthaphu–Birwa, 1100–2100 m (Nov. 27, 1963, fr.).

Distr. E. Himalaya (Nepal, Sikkim).

This is the first record from Nepal. The type locality is Darjeeling, Sikkim.

Entodon concinnus (De Not.) Paris subsp. **caliginosus** (Mitt.) U. Mizushima in Journ. Hattori Bot. Lab. **22**: 116, f. 7, A–C (1960).

Stereodon caliginosus Mitt. in Journ. Linn. Soc. Suppl. **1**: 108 (1859).

E. Nepal: Walunchung Gola–Zongi, 2700–3800 m (Nov. 11, 1963); Zongi–Iladanda, 1800–2700 m (Nov. 12, 1963). Darjeeling, Observatory Hill (north side), on twigs of *Berberis* (Apr. 2, 1960, no. 200037).

Distr. Nepal, and China (Shensi, Yunnan, Kansu); new to Sikkim. subsp. *caliginosus* var. *Fauriei* (Broth. & Par.) U. Mizushima, Japan. subsp. *concinnus*, Europe, Asia (Caucasus, Persia, Turkestan, Manchuria, Altai region and Siberia) and N. America (Alaska, Newfoundland, Colorado and New Mexico).

This species is known to grow usually on calcareous rocks, but in the Himalayas and Southwestern China (var. *caliginosus*) on granite and sandstone, too. NICH 200037 is epiphytic with a lichen on the twigs of *Berberis*, and this is a new record of a substratum.

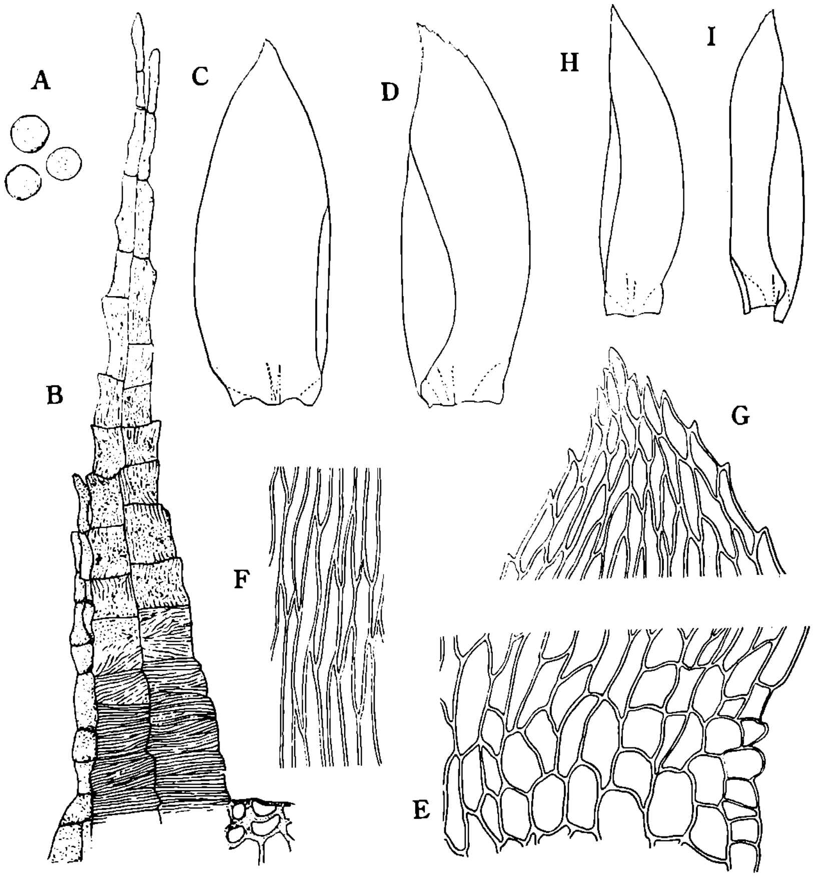

Fig. 40. *Entodon chloropus* Ren. et Card.
A. Spores, ×250. B. Outer view of peristome, ×250. C, D. Stem-leaves, ×22. E. Alar part of stem-leaf, ×250. F. Median leaf-cells, ×250. G. Apical part of stem-leaf, ×250. H, I. Branch-leaves, ×22. (Drawn from the holotype.).

Entodon cf. **flavescens** (Hooker) Jaeg. et Sauerb. in Ber. Sci. Gall. Naturw. Ges. **1876–77**: 293 (1879).

Neckera flavescens Hook. in Trans. Linn. Soc. **9**: 314, t. 27, f. 2 (1808)–Schwaegr., Suppl. Musc. Frond. **2**(2): 156, t. 141 (1824).

Stereodon Schwaegricheni Mitt. in Journ. Linn. Soc. Suppl. **1**: 108 (1859).

E. Schwaegrichenii (Mitt.) Broth. in Par., Ind. Bryol. ed. 2, **5**: 151 (1906); non C. Muell. (1844).

E. Nepal: Bhuspate Danra–Mai Majuwa, 1600–2900 m (Dec. 3, 1963).

Distr. Himalaya (N. W. India to Nepal).

Entodon laetus (Griff.) Jaeg. et Sauerb. in Ber. Sci. Gall. Naturw. Ges. **1876–77**: 295 (1879). [Fig. 41]

Neckera laeta Griff. in Calcut. Journ. Nat. Hist. **3**: 67 (1843).

E. Nepal: Bilbatay Bhanjang, 2200 m (Oct. 25, 1963, fr.); Bilbatay Bhanjang–Hati Sar, 2200–3000 m (Oct. 27, 1963, fr.); Minchin Dhap–Mul Pokhari, 2400–2800 m (Oct. 29, 1963, fr., on bark); Walunchung Gola–Zongi, 2700–3800 m (Nov. 11, 1963, fr.); Selap–Walunchung Gola, 2600–3200 m (Nov. 10, 1963, fr.); Baroya Khimty–Thakma Khola, 2500–3000 m (Nov. 16, 1963, fr., on bark); below Siling Tzokupa–Siling Tzokupa, 2000–3000 m (Nov. 21, 1963, fr.); Batasay–Bhuspate Danra, 2300–2600 m (Dec. 1, 1963, fr.); Bhuspate Danra–Mai Majuwa, 1600–2900 m (Dec. 3, 1963,

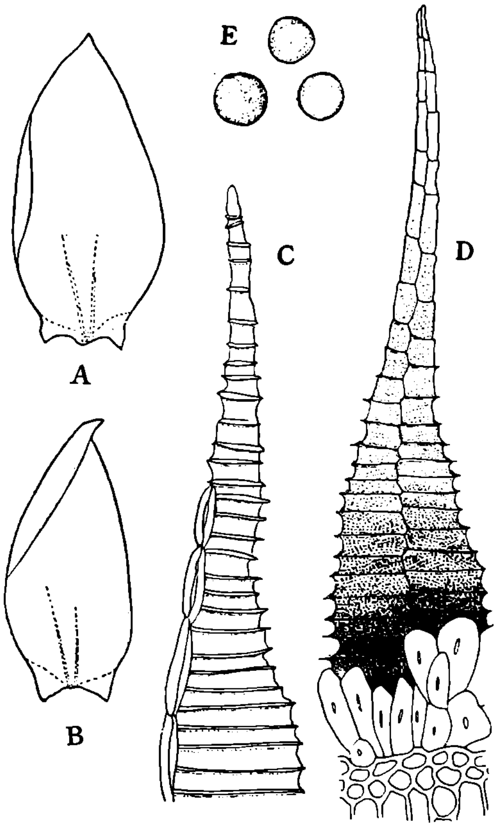

Fig. 41. *Entodon laetus* (Griff.) Jaeg. et Sauerb.
A-B. Stem-leaves, ×22. C. Inner view of peristome, ×250. D. Outer view of peristome, ×250. E. Spores, ×250. (Drawn from the specimen collected in Sikkim, Hooker 744 in NY).

fr., on bark). Darjeeling: Batasi, 2150 m (May 4, 1960, fr., on bark); Batasi–Palmajua, 2150–2300 m (May 3, 1960, fr., on bark).

Distr. E. Himalaya (Nepal, Sikkim), and Assam.

New to Nepal.

Entodon myurus (Hook.) Hampe in Linnaea **20**: 82 (1847).

Pterogonium myurum Hook., Musc. Exot. **2**: 148, t. 148 (1819).

Sikkim: Yoksam, 1700 m (May 17, 1960, fr.).

Distr. Himalaya (Simla, Kumaon, Nepal, Sikkim), W. China (Yunnan), and Korea.

Entodon nepalensis U. Mizushima, sp. nov. [Fig. 42]

Planta luteo-nitens. Caulis repens, 3–5 cm. longus, irregulariter pinnatus, ramis numerosis subcongestis, plerumque arcuato-ascendentibus. Folia madida erecto-patentia, vix compressa, sicca imbricata, concava, integra: nervis binis, brevibus; cellulis linearibus, in medio folii 6–7 × 0.5–0.6 μ, alaribus quadratis, numerosis, pellucidis. Folia caulina inferiora 1.5–1.6 mm. longa, 0.6–0.7 mm. lata, oblonga, obtusa. Folia caulina media 1.9 mm. longa, 0.9–0.95 mm. lata, elliptica, apiculata. Folia ramea oblonga, 1.6–1.8 mm. longa, 0.65–0.75 mm. lata, margine revoluta. Folia perichaetialia erecta, ovato-lanceolata, caudato-vel solo-acuminata, integra, concava, enervia. Capsula cum operculo 2.5–3.0 mm. longa, lutescenti-fusca, erecta, symmetrica, oblongo-cylindrica. Opercula conica, oblique rostrata. Peristomium duplex. Exostomii dentes lineari-lanceolati, subulati, lutescentes, tuberculosi, lamellis altis, apice hyalini; endostomii processi rudimentales et exostomii dentes adhaerentes. Sporae globosae 35–47 μ in diametro, grosse denseque tuberculosae. Annulus simplex, cellulae marginales annuli anguste oblongae.

Type: Batasay-Bhuspate Danra, 2300-2800 m, in East Nepal (H. Hara, H. Kanai, S. Kurosawa, G. Murata, M. Togashi & T. Tuyama, Dec. 1, 1963—holotype in NICH, no. 237307, fr.; dupl. in TI).

The species is characterized by its non-complanate branches with concave, obtuse and apiculate leaves, not so highly lamellate exostome teeth, very rudimentary broken segments of endostome which adhere to the inside of exostome teeth scatteringly, oblong and hyaline cells of the annulus, and somewhat distorted large spherical spores whose surface is densely and largely tuberculate. In the character of the peristome, annulus and spores, it is evident that the species belongs to the section Scabridentes. It comes near to *E. laetus*, but differs in the annulus and exostome teeth, endostome segments, and the spores. The species is also allied to the Japanese *Entodon conchophyllus*, but is easily distinguished from the latter by not caudate-acuminate leaves, smaller spores and by very thick-walled inside of the exostome. The spore of *E. conchophyllus* is the biggest in the genus, 27–44 × 45–57 μ, and *E. nepalensis* is the second.

Entodon plicatus C. Muell. in Linnaea **18**: 706 (1845).

Pterogonium aureum Griff., Not. 449 (1849).

Stereodon plicatus (C. Muell.) Mitt. in Journ. Linn. Soc. Suppl. **1**: 106 (1859).

E. Nepal: Iladanda–Selap, 1800–2600 m (Nov. 9, 1963, fr.). Sikkim: Pamianchi–Gayzing Bazar, 2000–1550 m (May 13, 1960, fr.); Gangtok, 1900 m (Jun. 17, 1960, fr.).

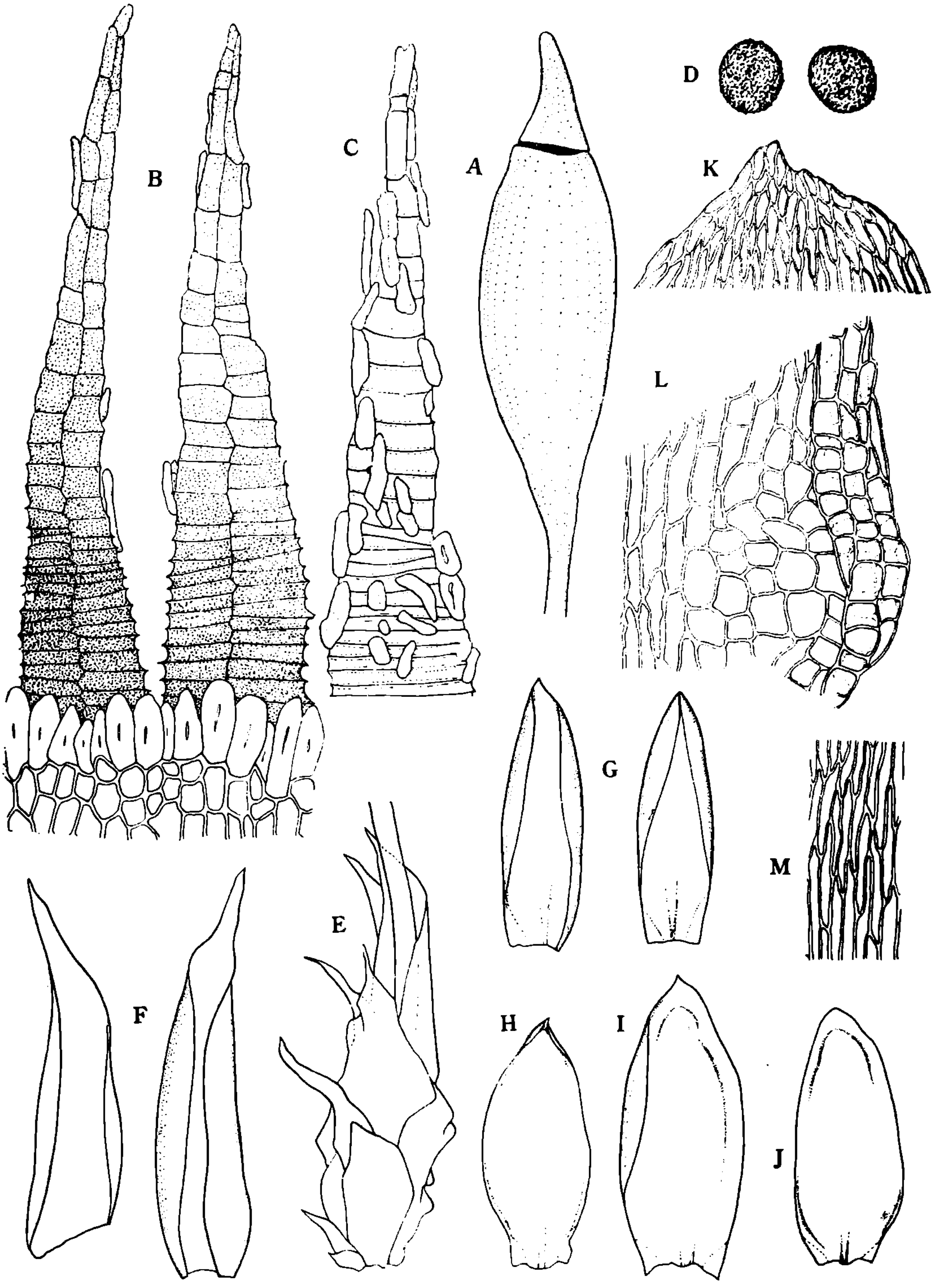

Fig. 42. *Entodon nepalensis* U. Mizushima
A. Capsule, ×22. B. Outer view of peristome, ×250. C. Inner view of peristome, ×250. D. Spores, ×250. E. Base of seta with perichaetial leaves, ×22. F. Perichaetial leaves, ×22. G. Branch-leaves, ×22. H-J. Stem-leaves, ×22. K. Apical part of stem-leaf, ×250. L. Basal part of stem-leaf, ×250. M. Median leaf-cells of stem-leaf, ×250. (Drawn from the holotype).

Distr. E. Himalaya (Nepal, Sikkim), east to SE. India, Ceylon, Assam, and Burma.

Entodon prorepens (Mitt.) Jaeg. et Sauerb. in Ber. Sci. Gall. Naturw. Ges. **1876–77**: 294 (1879).

Stereodon prorepens Mitt. in Journ. Linn. Soc. Suppl. **1**: 107 (1859).

E. Nepal: Bilbatay Bhanjang, 2200 m (Oct. 25, 1963, fr.); Selap–Walunchung Gola, 2600–3200 m (Nov. 10, 1963, fr.); Walunchung Gola–Zongi, 2700–3800 m (Nov. 11, 1963, fr.); Zongi–Iladanda, 1800–2700 m (Nov. 12, 1963, fr.); Bhuspate Danra–Mai Majuwa, 1600–2900 m (Dec. 3, 1963, fr.).

Distr. Himalaya (N. W. India to Nepal), Assam, S. W. India (W. Ghats), and W. China (Yunnan).

Entodon rubicundus (Mitt.) Jaeg. et Sauerb. in Ber. Sci. Gall. Naturw. Ges. **1876–77**: 285 (1879)–U. Mizushima in Journ. Hattori Bot. Lab. **22**: 119, f. 7, D–P (1960).

Stereodon rubicundus Mitt. et *S. Griffithii* Mitt. in Journ. Linn. Soc. Suppl. **1**: 108 (1859).

E. Nepal: Bilbatay Bhanjang, 2200 m (Oct. 26, 1963, fr., crowded short setae); Bilbatay Bhanjang–Hati Sar, 2200–3000 m (Oct. 27, 1963); Minchin Dhap–Mul Pokhari, 2400–2800 m (Oct. 29, 1963); Iladanda–Helok, 1500–1900 m (Nov. 13, 1963); Yamphodin–Ghatte, 1600–2100 m (Nov. 18, 1963); near Chyangthaphu–Birwa, 1100–2100 m (Nov. 27, 1963, fr., very long setae). Sikkim: Darjeeling–Victoria Fall, 2200–1950 m (Apr. 3, 1960, on rock); Darjeeling, Rimbick, 2200 m (May 6, 1960, fr. short setae); Yoksam, 1700 m (May 17, 1960, 13 specimens; two are sterile, two have short setae, eight have long setae, one has long and short setae in a mat); Penlong La, near Gangtok, 2100 m (Mar. 18, 1963); Peshok–Lopchu, 1800 m (Apr. 28, 1960, fr. rather short setae).

Distr. E. Himalaya (Nepal to Bhutan), Assam, S. India, Andaman Ins., Philippines, China, Korea, E. Asiatic URSS, and Japan.

This species seems to grow abundantly and widely from 1100–3000 m alt. and the specimens which I examined were mostly fertile in contrast to the Japanese representative (*E. ramulosus* Mitt.) type from Japan and synonymous with this species which is usually sterile. In the Japanese plants, the setae are up to 2.5 cm in length, and the capsules are 3.5–4.0 mm long excepting the operculum, while in the Indian and Himalayan plants the sporogons are in many cases as long as those of Japan. But larger ones consist of the setae 3.5 cm long and the capsules 4.0 mm long excepting operculum. Sometimes the sporogons have very short setae only 1.3 cm and capsules 2.0 mm excepting operculum. In these sporogons the upper part of setae and the capsules are commonly light-colored, and the capsules tend to be produced many on a stem, but the structure of peristome and spores are not different from those of the Japanese plant. While the characters of gametophyte are fairly constant. The variation in size of sporogons in the Indian plants does not correlate with the habitat conditions.

Entodon scariosus Ren. et Card. in Bull. Soc. Bot. Belg. **34** (2): 75 (1896). [Fig. 43]

Sikkim: Pamianchi–Gayzing Bazar, 2000–1550 m (May 13, 1960, fr.).

Distr. Sikkim.

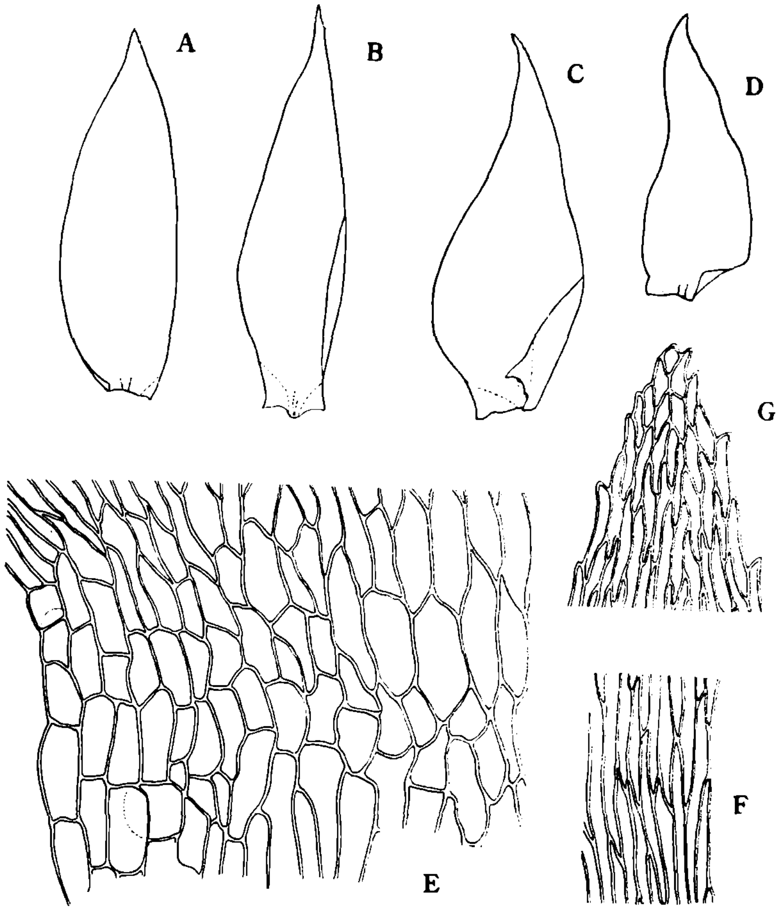

Fig. 43. *Entodon scariosus* Ren. et Card.
A–B. Branch-leaves, ×22. C–D. Stem-leaves, ×22. E. Alar part of stem-leaf, ×250. F. Median leaf-cells, ×250. G. Apical part of stem-leaf, ×250. (Drawn from the holotype.)

This is the second report of this species. The peristome structure is near to *E. chloropus* as Cardot described (1896), but it is not so difficult to discriminate each other. *E. scariosus* appears to be less glossy, while *E. chloropus* has silky lustre. The setae of *E. scariosus* are stout and the capsules are opaque, but *E. chloropus* has very slender setae with narrow and lustrous capsules. The shape of the stem-leaves is also somewhat different between two species as shown in fig. 43 and fig. 40.

Erythrodontium julaceum (Schwaegr.) Par., Ind. Bryol. 436 (1896)–Fleisch., Musc. Fl. Buitenz. **4**: 1138, f. 189 (1915).

Neckera julacea Hook. in Schwaegr., Suppl. **3**(1): 2, t. 245 (1829).

Pterogonium squarrosum Griff., Not. 448 (1841); Icon. Pl. Asiat. **2**: t. 98 (1849).

Stereodon juliformis Mitt. in Journ. Linn. Soc. Suppl. **1**: 92 (1859).

P. julaceum (Schwaegr.) Bosch et Lac., Bryol. Jav. **2**: 107, t. 217 (1864).

E. Nepal: Dhankuta, 1200 m (Oct. 19, 1963, fr.; Oct. 20, 1963, fr.); Bilbatay Bhanjang–Hati Sar, 2200–3000 m (Oct. 27, 1963, fr.); Hati Sar–Minchin Dhap, 2600–3000 m (Oct. 28, 1963, one specimen with young fr., two other specimens with ripe fr.); Taplejung–Garhi Danra, 1700–2000 m (Nov. 3, 1963, fr.). Sikkim: Pamianchi, 2000 m (May 13, 1960, fr.); Yoksam, 1700 m (May 17, 1960, fr.).

Distr. E. Himalaya (Nepal to Bhutan), Assam, Burma, S. India, Ceylon, Sumatra, Java, Celebes, Philippines, Tonkin and W. China (Yunnan).

Levierella fabroniacea C. Muell. in Bull. Soc. Bot. Ital. **1897**: 73 (1897).

E. Nepal: Bilbatay Bhanjang, 2200 m (Oct. 25, 1963, fr.); Minchin Dhap–Mul Pokhari, 2400–2800 m (Oct. 29, 1963, fr.).

Distr. Himalaya, C. and SW. India, and China (Szechuan).

According to Brotherus' Musci in the second edition of Engler's Pflanzenfamilien (1925), var. *abyssinica* (Broth.) Dix. is distributed in Abyssinia and Transvaal.

Rozea pterogonioides (Hook.) Jaeg. & Sauerb. in Ber. Sci. Gall. Naturw. Ges. **1876–77**: 274 (1879)–Noguchi in Candollea **19**: 188, t. 3 (1964).

Leskea pterogonioides Harvey in Hook., Icon. Pl. **1**: t. 24, f. 8 (1836); in Hook. Journ. Bot. **2**: 17 (1840).

E. Nepal: Selap–Walunchung Gola, 2600–3200 m (Nov. 10, 1963, fr.); Thakma Khola–Yamphodin, 2100–3300 m (Nov. 17, 1963, fr.); below Siling Tzokupa–Siling Tzokupa, 2000–3000 m (Nov. 21, 1963, fr.). Sikkim: Jongri, 4000–4200 m (May 21, 1960); Jongri–Panding–Gamothang, 3600–4200 m (May 26, 1960). Darjeeling: Phalut, 3550 m (May 11 & Jun. 5, 1960, fr.); Phalut–Sandakphu, 3200–3550 m (Jun. 6, 1960).

Distr. E. Himalaya (Nepal, Sikkim), NE. India, Burma, and W. China (Yunnan).

Trachyphyllum inflexum (Harvey) Gapp in Pl. Welwitsch. **2**(2): 298 (1901)–Fleisch., Musc. Fl. Buitenz. **4**: 1141, f. 190 (1915).

Hypnum inflexum Harvey in Hook., Icon. Pl. **1**: t. 24, f. 6 (1836); in Hook. Journ. Bot. **2**: 20 (1840).

Stereodon inflexus (Harvey) Mitt. in Journ. Linn. Soc. Suppl. **1**: 92 (1859).

Sikkim: Gangtok, 1750 m (Jun. 13, 1960, fr.).

Distr. E. Himalaya (Nepal, Sikkim), C. and S. India, Burma, Cambodia, Malacca, Philippines, New Caledonia, Java, and Madagascar.

PLAGIOTHECIACEAE (by Zennoske Iwatsuki)

Isopterygium albescens (Hook.) Jaeg. in Ber. Sci. Gall. Naturw. Ges. **1876–77**: 433 (1878).

Hypnum albescens Hook. in Schwaegr., Sp. Musc. Suppl. **3**(1): 226b (1828).

Selap–Walunchung Gola, 2600–3300 m (Nov. 10, 1963).

Distr. E. Himalaya (Nepal, Sikkim), Assam, Ceylon, east to Hawaii and New Zealand, north to Japan.

Isopterygium distichaceum (Mitt.) Jaeg. in Ber. Sci. Gall. Naturw. Ges. **1876–77**: 439 (1878).

Stereodon distichaceus Mitt. in Journ. Linn. Soc. Suppl. **1**: 105 (1859).

Baroya Khimty–Thakma Khola, 2500–3000 m (Nov. 16, 1963); Siling Tzokupa, 2000–3000 m (Nov. 21, 1963); Bhuspate Danra–Mai Majuwa, 1600–2900 m (Dec. 3, 1963).

Distr. E. Himalaya (Nepal).

Isopterygium Muellerianum (Schimp.) Jaeg. in Ber. Sci. Gall. Naturw. Ges. **1876–77**: 441 (1878).

Plagiothecium Muellerianum Schimp., Syn. 584 (1869).

Phalut, 3500 m (Jun. 4, 1960).

Distr. Europe, E. Himalaya (Darjeeling), China, Japan, and N. America.

Plagiothecium neckeroideum B.S.G. in Bryol. Eur. **5**: 16 (1851).

Stereodon neckeroideus (B.S.G.) Mitt. in Journ. Linn. Soc. Supp. **1**: 103 (1859).

Pamianchi-Gayzing Bazar, 2000–1500 m (May 13, 1960); Jongri, 4000 m (May 19 & 22, 1960); Phalut, 3550 m (Jun. 5, 1960); Sandakphu-Tonglu, 3550–3000 m (Jun. 7, 1960); Darjeeling-Tiger Hill, 2150–2500 m (Jun. 23, 1960); Rabong La-Temi, 1000–1300 m (Mar. 28, 1963); Walunchung Gola-Zongi, 2700–3800 m (Nov. 11, 1963); Zongi-Iladanda, 1800–2700 m (Nov. 12, 1963); Thakma Khola-Yamphodin, 2100–3300 m (Nov. 17, 1963); Yamphodin-Ghatte, 1600–2100 m (Nov. 18, 1963).

Distr. Europe, E. Himalaya (Nepal, Sikkim), Java, New Guinea, Philippines, Formosa, and Japan.

Plagiothecium sylvaticum (Brid.) B.S.G. in Bryol. Eur. **5**: 192 (1851).

Hypnum sylvaticum Brid., Musc. Rec. **2**(2): 53 (1801).

Stereodon nemoralis Mitt. in Journ. Linn. Soc. Suppl. **1**: 104 (1859), syn. nov.

Phalut, 3550 m (Jun. 4 & 5, 1960); Helok, 1500 m (Nov. 8, 1963); Walunchung Gola-Zongi, 2700–3800 m (Nov. 11, 1963).

Distr. Europe, Africa, Himalaya (Kashmir to Bhutan), Tonkin, Japan, Siberia, and N. America.

Taxiphyllum taxirameum (Mitt.) Fleisch. in Musc. Fl. Buitenz. **4**: 1435 (1923).

Stereodon taxirameus Mitt. in Journ. Linn. Soc. Suppl. **1**: 105 (1859).

Rayang, 2500 m (Apr. 20, 1960); Iladanda-Selap, 1800–2600 m (Nov. 9, 1963).

Distr. Himalaya (Simla to Bhutan), Assam, Ceylon, Java, Sumatra, New Guinea, China, Formosa, and Japan.

SEMATOPHYLLACEAE (by Akira Noguchi)

Acanthocladium tanytrichum (Mont.) Broth. in Par., Ind. Bryol. ed. 2, **1**: 3 (1903). (det. Norkett)

Darjeeling: Senchal Rest House-Ghum, 2400–2200 m. Sikkim: Jongri, 4000 m.

Distr. Himalaya, Java, and Sumatra.

Aptychella Mulleri Dix. in Ann. Bryol. **6**: 32 (1933). (det. Norkett)

Sikkim: Migothang-Nayathang, 3300 m. Darjeeling: Phalut-Sandakphu, 3200–3550 m.

Distr. Himalaya.

Aptychella planula (Mitt.) Fleisch. in Musc. Fl. Buitenz. **4**: 1671 (1922). (det. Iwatsuki).

Nepal: Helok-Baroya Khimty, 1500–2500 m.

Distr. E. Nepal and Sikkim.

Clastobryum cf. **subplanulum** Broth. in Ann. Bryol. **6**: 33 (1933). (det. Norkett).

Sikkim: Jongri-Gamothang, 3600–4000 m.

Distr. Himalaya.

Struckia argentata (Mitt.) C. Mull. in Rev. Bryol. **20**: 95 (1893).

Darjeeling: Phalut, 3550 m.

Distr. Himalaya, and Yunnan.

HYPNACEAE (by Akira Noguchi)

Calliergonella cuspidata (Hedw.) Loesk. in Hedwigia **50**: 248 (1911).

Darjeeling: Ghum–Senchal, 2250 m; Kurseong, 1550 m; Sandakphu–Tonglu, 3500–2600 m; Phalut–Sadakphu, 3200–3550 m.

Distr. Cosmopolitan.

Calliergonella Schreberi (B. S. G.) Grout, Moss Fl. N. Am. **3**: 103 (1931).

Sikkim: Jongri, 4000 m.

Distr. Cosmopolitan.

Leptohymenium tenue (Hook.) Schw., Sp. Musc. Suppl. **3**(1): 246c (1828).

Darjeeling: Ramam, 2400 m; Rimbick–Shiri Kola, 2200–1900 m: Phalut–Dentam, 3650–1450 m; Sandakphu–Tonglu, 3550–2600 m. Sikkim: Jongri, 4000 m. Nepal: Helok–Baroya Khimty, 1500–2500 m, +*Diaphanodon blandus*; Baroya Khimty–Thakma Khola, 2500–3000 m, +*Trachypodopsis auriculata*; Thakma Khola–Yamphodin, 2100–3300 m; Batasay–Bhuspate Danra, 2300–2600 m, +*Trachypodopsis serrulata* var. *crispatula*; Selap–Walunchung Gola, 2600–3200 m.

Distr. Himalaya, Burma, and Yunnan.

Aside from the sporophyte, there is no reliable distinction between the genera *Leptohymenium* and *Macrothamnium*. The relationships among the genera, *Macrothamnium*, *Gollania*, *Neodolichomitra*, *Elmeriobryum*, *Rhytidiadelphus*, and *Leptohymenium* will be discussed in future monographic study.

Macrothamnium macrocarpum (Reinw. et Hornsch.) Fleisch. in Hedwigia **44**: 308 (1905).

Sikkim: Peshok–Lopchu, 1500 m. Nepal: Helok, 1500 m; Selap–Walunchung Gola, 2600–3200 m; Walunchung Gola–Zongi, 2700–3800 m; Baroya Khimty–Thakma Khola, 2500–3000 m: Thakma Khola–Yamphodin, 2100–3300 m; Yamphodin–Ghatte, 1600–2500 m; Birwa–Yektin, 1200–2500 m.

Distr. Himalaya, India, Ceylon, Burma, Thai, Java, Philippines, and Formosa.

Macrothamnium pseudostriatum (C. Mull.) Fleisch. in Hedwigia **44**: 310 (1905).

Neapl: without definite locality.

Distr. Nepal, India, Ceylon, and Sumatra.

Macrothamnium submacrocarpum (Ren. et Card.) Fleisch. in Hedwigia **44**: 310 (1905).

Darjeeling: Phalut, 3550 m; Sandakphu–Tonglu, 3500–2600 m; Ghum–Tiger Hill, 2300–2500 m; Batasi, 2150 m, +*Mnium Maximowiczii*. Sikkim: Jongri, 4000 m; Pamianchi–Gayzing Bazar, 2000–1550 m. Nepal: Taplejung, 1700 m; Helok–Baroya Khimty, 1500–2500 m; Baroya Khimty–Thakma Khola, 2500–3000 m; Thakma Khola–Yamphodin, 2100–3000 m; Batasay–Bhuspate Danra, 2300–2600 m; Bhuspate Danra–Mai Majuwa, 1600–2900 m.

Distr. Himalaya, Burma, and Thai.

I have not been able to examine the type specimen of this species and therefore have made no attempt to discuss in detail its relationship to other species of the genus. The collections listed above match almost exactly those specimens determined by Fleischer (Mitten herbarium, no. 952 from Senchal, Darjeeling).

Pylaisia aurea (Hook.) Broth. in Engl., Pfl.-fam. I, **3**: 886 (1907). (det. Norkett)

Darjeeling: Batasi, 2150 m. Sikkim: Jongri–Gamothang, 4000–3750 m: Jongri, 4000–4200 m.

Distr. Himalaya.

HYLOCOMIACEAE (by Akira Noguchi)

Hylocomium himalayanum (Mitt.) Jaeg. in Ber. Sci. Gall. Naturw. Ges. **1877-78**: 348 (1880).

Sikkim; Nayathang–Phalut, 3500 m, on the basal part of shrubs.

Distr. Himalaya, and Japan.

I wish to express my cordial thanks to Dr. P. C. Chen of the Teachers College, Nanking, China, to Dr. J. E. Dandy of the British Museum (Nat. Hist.), London, to Mme S. Jovet–Ast of the Muséum National d'Histoire Naturelle, Paris, to Dr. C. Rogerson of the New York Botanical Garden, New York, and to Dr. H. Roivainen of the Helsinki University for their kindness in sending me the type or valuable specimens in their herbaria. I am indebted to Dr. Z. Iwatsuki of the Hattori Botanical Laboratory and Mr. A. H. Norkett of the British Museum (Nat. Hist.), London for their determination of several collections. My sincere thanks are also due to Dr. A. J. Sharp for his kind correction of English text. (A. Noguchi)

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LICHENES

by Yasuhiko Asahina

The Lichen specimens were mainly collected by Makoto Togashi.

Cladonia Vain. Subgenus Cladina (Nyl.) Vain.

Cladonia rangiferina (L.) Web.

Sikkim: Jongri (22. V. 1960).

Subgenus Clathrina (Müll. Arg.) Zahlbr.

Cladonia aggregata (Sw.) Ach.

Darjeeling: Takdah (16. IV. 1960); Senchal (16. IV. 1960); Sandakphu (6. VI. 1960). Sikkim: Migothang-Nayathang (1. VI. 1960).

All specimens contain barbatic acid (P–).

Subgenus Cenomyce (Ach.) Th. Fr.

Sect. Cocciferae Del. Subsection Stramineo-flavidae Vain.

Cladonia pleurota (Flk.) Schaer.

Darjeeling: Senchal, 2400 m (16. IV. 1960); Ramam (8–11. V. 1960); Phalut-Sandakphu (6. VI. 1960); Sandakphu–Tonglu (7. VI. 1960). Sikkim: Jongri (20-23. V. 1960); Olothang-Jongri (23. V. 1960); Migothang (1. VI. 1960). East Nepal: Batasay, etc. (2–11. XI. 1963); Batasay–Halhale (1. XII. 1963).

All specimens contain usnic acid and zeorin.

Cladonia yunnana (Vain.) des Abb. in Candollea **16**: 202 (1958).

Sikkim: Jongri, 4000 m (20. V. 1960); Olothang–Jongri (23. V. 1960); Migothang–Nayathang (1. VI. 1960).

This species distinguishes itself from resembling *Cladonia digitata* Schaer. by the medullary reaction K—or by the conspicuous fluorescence caused by the irradiation with U.V. ray (squamatic acid).

Subsect. Subglaucescentes Vain.

Cladonia Floerkeana (Fr.) Sommf. var. **intermedia** Hepp

Darjeeling: Phalut, 3500 m (10. V. 1960).

This specimen contains besides usnic acid and barbatic acid a trace of didymic acid.

Cladonia bacillaris Nyl. f. **tenuistipitata** Sandst.

Darjeeling: Rimbick (6. V. 1960).

This specimen contains, besides usnic acid and barbatic acid, didymic acid and its ether extract is colored by C (moistened with alcohol) green.

f. **clavata** (Ach.) Vain.

Darjeeling: Senchal (16. IV. 1960). Sikkim: Olothang-Jongri (23. V. 1960); Jongri–Gamothang (26. V. 1960.)

These specimens contain barbatic and didymic acids together with usnic acid.

Cladonia vulcanica Zollinger: Vain., Monogr. Clad. Univ. **1**: 145 (1887).

f. **vulcanica**

Darjeeling (2. IV. 1960); Senchal (6. IV. 1960); Kurseong (12. IV. 1960); Takdah (18. IV. 1960).

These specimens contain, besides usnic acid, thamnolic acid and didymic acid but not barbatic acid.

f. **melanodes** des Abb. in Kew Bull. **1956**(2): 259–261 (1956).

Darjeeling: Rimbick (6. V. 1960); Ramam (8. V. 1960); Phalut (2. VI. 1960).

Cladonia macilenta (Hoffm.) Nyl. f. **tomentosula** Flk.

E. Nepal: Yamphodin-Ghatte. (18. XI. 1963).

External appearance of this specimen resembles closely *Cladonia bacillaris* Nyl. f. *clavata* (Ach.) Vain. It contains besides usnic acid, barbatic, thamnolic and didymic acids.

Sect. Ochrophaeae Vain. Subsect. Unciales (Del.) Vain.

Cladonia amaurocraea (Flk.) Schaer. f. **oxyceras** (Ach.) Oliv.

Sikkim: locus accuratus ignotus.

Cladonia Delavayi des Abb. in Candollea **16**: 203 (1958).

Sikkim: Yoksam (21–22. V. 1960); Jongri, 4000 m (23. V. 1960); Olothang-Jongri (29. V. 1960); Gamothang, 3900 m (29. V. 1960).

H. des Abbayes found the thalline reaction of this species as K–, C–, KC+ yellow and confirmed the presence of usnic acid only.

If we extract the thalline fragments of *Cladonia Delavayi* with cold ether and evaporate the solution to dryness, there remains an almost colorless crystalline powder (A), which yields on recrystallization from G.E. solution usnic acid crystals alone. But it (A) exhibits temporarily brownish red KC reaction changing gradually in deep yellow. This contaminate substance was distinctly demonstrated by thin layer chromatogram. Developing solution of ether extract . . . benzene: ethylacetate: formic acid=5:2:0.2. Silicagel was mixed with oxalic acid solution and sprayed upon the glass plate. a, b . . . starting points of ether extract and of pure unsic acid respectively. Rf. . . 0.78. . . . corresponds with unsic acid. Rf. . . 0.60. . . . a substance contaminated with the usnic acid. (Fig. 44)

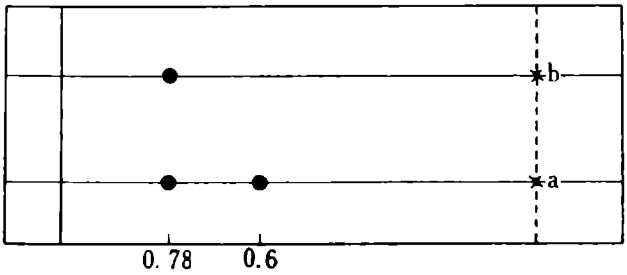

Fig. 44.

Formerly the author has misidentified this species with *Cladonia sylvatica* (L.) Hoffm. (cf. Fauna and Flora of Nepal Himalaya. Scientific Results of the Japanese Expedition to Nepal Himalaya 1952–1953. **1**: 47, 1955). H. des Abbayes pointed out the presence of cortex on the podetia and arranged this species in Subsect. Unciales.

Subsect. Chasmariae (Ach.) Vain. Ser. Microphyllae Vain.

Cladonia furcata (Huds.) Schrad.

var. **racemosa** (Hoffm.) Flk. f. **squamulifera** Sandst.

Darjeeling: Rimbick (8. V. 1960); Phalut (11. V. 1960). Sikkim: Jongri, 4000 m (22. V. 1960).

var. **pinnata** Flk. f. **foliolosa** Del.

Darjeeling: Ramam (8. V. 1960). Sikkim: Jongri (21. V. 1960); Migothang-Nayathang (1. VI. 1960).

f. **truncata** Flk.

Sikkim: Olothang-Jongri (23. V. 1960). Darjeeling: Phalut, 3500 m (2. VI. 1960); Sandakphu (6. VI. 1960).

f. **regalis** Flk.

Sikkim: Migothang-Nayathang (1-2. VI. 1960). Darjeeling (6. VI. 1960).

Some specimens of f. *regalis* resemble closely *Cladonia macroptera* Räs. However, the latter belongs to the group of *Cladonia scabriuscula* (Del.) Coem. and must be kept distinct.

In Journ. Jap. Bot. **16**: 403 (1940), the author acknowledged the autonomy of *Cladonia macroptera* Räs. and established two formae. But in the same journal **19**: 196 (1943), he abandoned the above opinion and identified *Cladonia macroptera* with *Cladonia scabriuscula* (Del.) Coem. f. *elegans* Robbins (cf. Sandstede Cl. Exsicc. no. 1570) while the two formae "f. *ramosa*" and "f. *subnuda*" were transformed to *Cladonia furcata* (Huds.) Schrad. v. *pinnata* (Flk.) Vain. Though the podetia of *Cladonia furcata* v. *pinnata* are sometimes dispersed areolate, they are never sorediose nor isidiose decorticate and their squamae are only shallowly lobed. On the contrary the podetia of *Cladonia macroptera* are always sorediose and their squamae are deeply laciniate and are always sorediose on the underside.

Cladonia scabriuscula (Del.) Coem. f. **adspersa** Flk.

Darjeeling (2. IV. 1960); Senchal (16. IV. 1960); Takdah (18. IV. 1960); Ramam (8. V. 1960); Phalut (10. V. 1960); Phalut-Sandakphu (6. VI. 1960).

f. **sublaevis** Sandst.

Darjeeling: Batasi (4. V. 1960).

f. **farinacea** Vain.

Sikkim: Jongri (22. V. 1960); Olothang-Jongri (23. V. 1960).

f. **cancerata** Müll. Arg.

E. Nepal: Batasay, etc. (1. XII. 1963).

Cladonia rangiformis Hoffm.

var. **pungens** (Ach.) Vain. f. **foliosa** Flk.

Darjeeling: Senchal (6. IV. 1960); Takdah (18. IV. 1960); Ramam (7-8. V. 1960); Sandakphu, 3400 m (6-7. VI. 1960); Jongri (20. V. 1960). E. Nepal: Sinduwa-Bilbatay Bhanjang (25. X. 1963); Dumhan-Taplejung (2. XI. 1963); Baroya Khimty-Thakma Khola (16. XI. 1963); Batasay-Halhale Bhanjang (2. XII. 1963); Bhuspate Danra-Bhandukay, etc. (3. XII. 1963).

Formerly the author misidentified this form with *Cladonia ceratophyllina* (Nyl.) Vain. (cf. Fauna and Flora of Nepal Himalaya **1**: 47, Fig. 9 on p. 48, 1955).

f. **versicolor** Elenk.: Savicz in Fedde, Rep. **19**: 352 (1924).

E. Nepal: Bilbatay Bhanjang, etc. (27. X. 1963); Hati Sar, etc. (28. X. 1963); Walunchung, etc. (11. XI. 1963); Helok-Baroya Khimty (15. XI. 1963); Batasay, etc. (1. XII. 1963); Mai Majuwa, etc. (4. XII. 1963).

var. **muricata** (Ach.) Arn.

Sikkim: Yoksam (18. V. 1960); Jongri (20. V. 1960).

var. **pseudofissa** Asahina, var. nov.

Statura thalli ut in *Cladonia furcata* (Huds.) Schrad. f. *fissa* Flk. sed differt strato chondroideo tenuiore et atranorinum continente.

Primary thallus disappearing, podetia up to 12 cm high, 2 cm thick brownish gray, repeatedly dichotomously branched, apices sharply pointed, longitudinally fissured.

Sikkim: Jongri, 4000 m (22. V. 1960—typus in TNS, TI); Migothang-Nayathang (1. VI. 1960). Darjeeling: Sandakphu, 3400 m (6. VI. 1960).

Cladonia squamosa (Scop.) Hoffm.

var. **levicorticata** Sandst. f. **turfacea** Rehm

Darjeeling: Kurseong, 1500 m (13. IV. 1960); Phalut (10. V. & 2. VI. 1960) Phalut-Sandakphu (6. VI. 1960). Sikkim: Jongri (20–23. V. 1960); Olothang-Jongri (23. V. 1960); Jongri Base Camp (25. V. 1960); Migothang (31. V. 1960). East Nepal: Hati Sar, etc. (28. X. 1963); Selap, etc. (10. XI. 1963).

Almost all specimens of *Cladonia squamosa* are inhabitants of moor land and dark colored, though some of them are only slightly darkened or even greenish white.

Subsect. Clausae Vain. Ser. Thallostelides Vain.

Cladonia gracilis (L.) Willd.

var. **elongata** (Jacq.) Vain. f. **laontera** (Del.) Arn.

Sikkim: Jongri (20–23. V. 1960); Jongri–Olothang (23. V. 1960); Migothang–Nayathang (1. VI. 1960). East Nepal: Walunchung Gola, etc. (11. X. 1963).

f. **Hugeninii** Kovar.

Sikkim: Migothang–Nayathang (1. VI. 1960).

f. **ceratosterioides** Kovar.

Darjeeling: Phalut (10. V. 1960); Phalut (2. VI. 1960); Sandakphu, 3400 m (6. VI. 1960). East Nepal: Baroya Khimty, etc. (16. XI. 1963).

Cladonia cornuta (L.) Schaer. f. **scyphosa** Schaer.

Sikkim: Jongri (22. V. 1960); Olothang-Jongri (23. V. 1960); Jongri–Gamothang (26. V. 1960).

Cladonia lepidota Nyl. f. **cerasphora** (Lynge) Sandst.

Darjeeling: Phalut–Sandakphu (6. VI. 1960).

Cladonia verticillata Hoffm. var. **evoluta** Th. Fr.

Sikkim: Yoksam, 1800 m (18. V. 1960); Jongri (22. V. 1960); Olothang-Jongri (23. V. 1960).

var. **cervicornis** (Ach.) Flk.

Sikkim: Jongri (22. V. 1960).

Cladonia calycantha Nyl.

E. Nepal: Hati Sar, etc. (28. X. 1963); Batasay, etc. (2. XII. 1963).

Cladonia cf. **gymnopoda** Vain.

E. Nepal: Batasay, etc. (1. XII. 1963).

A doubtful specimen of slender podetia.

Cladonia pyxidata (L.) Fr. var. **neglecta** Flk.

Sikkim: Jongri, 4000 m (21. V. 1960); Migothang (31. V. 1960).

Cladonia Rappii A. Evans in Trans. Connecticut Acad. Arts and Sci. **38**: 297 (1952).

f. **sikkimensis** Asahina, form. nov.

Thallus ut in *Cladonia verticillata* var. *cervicornis*, scyphis vulgo simplicibus vel raro e centro vel e margine scyphorum proliferis, 1–2(3) tabulatis, areolato corticatus, medulla P+flavens, acidum psoromicum continens.

Sikkim: Jongri (20. V. 1960—typus TNS, TI).

Externaly resembles closely *Cladonia verticillata* var. *cervicornis*, but differs by the thalline reaction P+ bright yellow.

Cladonia chlorophaea (Flk.) Spreng.

Darjeeling: Phalut (10. V. 1960). Sikkim: Jongri (20. V. 1960). E. Nepal: Baroya Khimty (16. XI. 1963).

Cladonia ochrochlora Flk.

Sikkim: Jongri (20. V. 1960); Gamothang (21. V. 1960). East Nepal: Batasay-Halhale, etc. (2. XII. 1963).

Cladonia coniocraea (Flk.) Sandst.

Darjeeling: Senchal, 2400 m (6. IV. 1960).

Cladonia cornutoradiata (Coem.) Zopf f. **subulata** (L.) Vain.

Darjeeling (6. IV. 1960). Sikkim: Preig Chu, 2100 m (19. V. 1960); Jongri-Gamothang (26. V. 1960). E. Nepal: Bilbatay Bhanjang, etc. (27. X. 1963).

f. **radiata** (Schrad.) Coem.

E. Nepal: Baroya Khimty, etc. (16. XI. 1963).

Cladonia cf. **Balfourii** Cromb.

Darjeeling: Takdah (18. IV. 1960).

Cladonia pityrea (Flk.) Fr. f. **crassiuscula** (Coem.) Vain.

Sikkim: Jongri, 4000 m (20–21–22. V. 1960); Olothang-Jongri (23. V. 1960); Jongri–Olothang (26. V. 1960). Darjeeling: Phalut–Sandakphu (6. VI. 1960).

f. **squamulifera** Vain.

Darjeeling (2. IV. 1960; 12. IV. 1960); Rimbick (6. V. 1960); Sandakphu (6. VI. 1960). Sikkim: Jongri (21. V. 1960); Jongri–Gamothang (26. V. 1960); Migothang-Nayathang (1. VI. 1960). East Nepal: Dumhan–Taplejung (1. XI. 1963); Selap-Zongi (10. XI. 1963).

f. **subuliformis** Vain.

Sikkim: Yoksam, 1800 m (17. V. 1960). Darjeeling: Senchal, 2400 m (16. IV. 1960).

f. **phyllophora** (Mudd) Vain.

Sikkim: Gangtok (13. VI. 1960). E. Nepal: Batasay etc. (2. XII. 1963).

f. **cladomorpha** Vain.

East Neapl: Birwa–Yektin (28. XI. 1963).

f. **subacuta** Vain.

Darjeeling: Kurseong, 1500 m (12. IV. 1960); Takdah (18. V. 1960). Sikkim: Jongri Base Camp, 4000 m (25. V. 1960).

f. **hololepis** Vain.

Darjeeling: Ramam (8. V. 1960). Sikkim: Yoksam (17. V. 1960).

Cladonia formosana Asahina f. **formosana**

Darjeeling: Senchal (6. IV. 1960); Kurseong (12. IV. 1960); Lopchu (28. IV. 1960). Sikkim: Yoksam (17. V. 1960). E. Nepal: Taplejung, etc. (3. XI. 1963).

f. **sublaevigata** Asahina

Darjeeling: Observatory Hill (2. IV. 1960); Rimbick (6–8. V. 1960).

f. **aberrans** Asahina

Darjeeling: Ramam (8. V. 1960); Takdah (18. IV. 1960).

Cladonia submultiformis Asahina f. **foliolosa** Asahina

Darjeeling, 2000 m (2. IV. 1960); Ramam (7. V. 1960); Phalut, 3500 m (10. V. 1960); Kurseong (12. IV. 1960); Senchal (6. IV. 1960)); Takdah (18. IV. 1960). Sikkim: Yoksam (17. V. 1960).

f. **humilis** Asahina, form. nov.

Thallus primarius persistens, ca 3 mm longus, 1–5 mm latus crenulato-lobatus. Podetia simplicia, subulata usque ad 15 mm longa, 1 mm crassa, decorticata, semipellucida, granulis minutis gonidiis continentibus dispersa. Pycnidia bene evoluta, ovoidea, 0.5 mm lata, nigra. Pycnoconidia curvata 6–7 μ longa, materiam coccineam non continentia.

Darjeeling: Kurseong, 1500 m (12. IV. 1960—typus TNS, TI).

Ser. Foliosae (Bagl. et Carest.) Vain.

Cladonia foliacea (Huds.) Schaer.

var. **meiophora** Asahina, var. nov.

Acidum usnicum tantum continens (P–)

Darjeeling: Phalut (10. V. 1960—typus TNS, TI).

Ser. Ochroleucae Fr.

Cladonia cyanipes Sommerf. f. **connectans** Vain.

Sikkim: Jongri (22. V. 1960).

Stereocaulon Schreb.[1]

Stereocaulon arbuscula Nyl. emend. Asahina in Journ. Jap. Bot. **19**: 282 (1943).

Sikkim: Jongri–Gamothang (26. V. 1960). E. Nepal: Preig Chu (10. XI. 1963). Acidum fumarprotocetraricum continens.

Stereocaulon pseudarbuscula Asahina in Journ. Jap. Bot. **19**: 282 (1943).

Sikkim: Preig Chu–Bakkim, 2200 m (19. V. 1960).

Acidum thamnolicum continens.

Stereocaulon coniophyllum M. Lamb in Botan. Notiser **114** (3): 266 (1961).

Darjeeling: Sandakphu–Tonglu (7. VI. 1960). Sikkim: Olothang–Jongri (23. V. 1960).

Atranorinum et acidum lobaricum continens.

Stereocaulon myriocarpum Th. Fr. var. **myriocarpum**

Sikkim: Bakkim–Jongri, 4000 m (20. V. 1960); Jongri (21. V. 1960); Olothang–Jongri (23. V. 1960); Gamothang (29. V. 1960); Migothang (31. V. 1960). Darjeeling: Phalut–Sandakphu (6. VI. 1960).

var. **orizabae** Th. Fr.

Sikkim: Jongri (21–22. V. 1960); Jongri Base Camp (25. V. 1960).

Stereocaulon Massartianum Hue, Lichenes Extra-Europaei no. 61.–*St. nesaeum* auctor. cf. M. Lamb in Journ. Jap. Bot. **40**: 271 (1965).

Sikkim: Preig Chu, 2100 m (19. V. 1960). Darjeeling: Takdah (18. IV. 1960).

Stereocaulon Montagneanum M. Lamb in Journ. Jap. Bot. **40**: 272 (1965).

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[1] This treatment of *Stereocaulon* is based on the determination of Dr. I. M. Lamb, who was kind enough to review the writers sendings.

E. Nepal: Baroya Khimty (16. XI. 1963).

Stereocaulon claviceps Th. Fr. var. **claviceps**

Medulla cephalodiorum densa, cellulis algorun chroococcoideis.

Darjeeling: Phalut (11. V. 1960). Sikkim: Bakkim, etc. 2100 m (19. V. 1960); Jongri, 4100 m (22. V. 1960); Olothang-Jongri (23. V. 1960); Jongri Base Camp, 4500 m (25. V. 1960); Gamothang, 3900 m (29. V. 1960).

var. **pomiferum** (Duv.) M. Lamb

Darjeeling: Phalut (10. V. 1960); Sandakphu-Tonglu (20–22. V. 1960). Sikkim: Jongri (20–22. V. 1960); Jongri-Olothang (23. V. 1960); Jongri Base Camp, 4500 m (25. V. 1960); Gamothang (29. V. 1960); Migothang, 4000 m (31. V. 1960).

Stereocaulon piluliferum Th. Fr.

Darjeeling: Senchal (16. IV. 1960).

Statura thalli ut in *St. claviceps* Th. Fr., sed differt medulla cephalodiorum laxa, cellulis gonidiorum vulgo scytonemoideis.

Stereocaulon foliolosum Nyl. var. **foliolosum**

Darjeeling: Phalut (10–11. V. 1960 & 5. VI. 1960); Phalut-Dentam (11. V. 1960); Phalut-Sandakphu (6. VI. 1960). Sikkim: Preig Chu, 2100 m (19. V. 1960); Olothang-Jongri (23. V. 1960).

Phyllocladia squamulosa, marginibus crenulatis laciniatisque.

var. **strictum** (Bab.) M. Lamb

Sikkim: Jongri (22–25. V. 1960); Migothang (31. V. 1960). Darjeeling (6. IV. 1960); Phalut (10. V. 1960).

Podetia inferne phyllocladiis cylindrico-coralloideis, superne globoso-granulatis.

Stereocaulon botryophorum Müll. Arg.

Sikkim: Jongri (21. V. 1960); Olothang-Jongri (23. V. 1960); Jongri Base Camp, 4500 m (25. V. 1960); Gamothang (29. V. 1960); Migothang (30. V. 1960).

Usnea Wigg. Subgenus Eumitria (Stirt.) Mot.

Usnea Bayleyi (Stirt.) Zahlbr., Cat. Lich. **6**: 542 (1930).

Eumitria Bayleyi Stirt. in Scot. Natur. **6**: 100 (1881).

Eumitria implicita Stirt. in Scot. Natur. **6**: 100 (1881).

Eumitria endorhodina Vain. in Philip. Journ. Sci. **4**: 651 (1909).

Usnea implicita (Stirt.) Zahlbr., Cat. Lich. **6**: 582 (1930).

subsp. **septentrionalis** Asahina, subsp. nov.

Thallus usque ad 25 cm longus, obscure sordide fusco-viridis rami, supra basin usque ad 2 mm crassi, increbre divaricato ramoso verruculosi, verruculis saepe dense sorediosis, medulla rubra.

Sikkim: Pamianchi, 2000 m (13. V. 1960, M. Togashi—typus in TNS, TI). Darjeeling (2. IV. 1960); Senchal (6. IV. 1960); Takdah (20. IV. 1960); Lopchu (28. IV. 1960); Rimbick (6. V. 1960); Kurseong, 1500 m (12. V. 1960). Sikkim: Yoksam, 1800 m (17. V. 1960); Gangtok, 1900 m (14. VI. 1960). East Nepal: Sinduwa, 2100 m (23. X. 1963); Bilbatay, etc., 2200 m (25. X. 1963); Hati Sar, etc. (28. X. 1963); Minchin Dhap, etc. (29. X. 1963); Birwa-Yektin (28. XI. 1963).

f. **creberrima** (Asahina) Asahina, comb. nov.

Usnea creberrima Vain. in Bot. Mag. Tokyo **35**: 46 (1921); in Journ. Jap. Bot. **40**: 33 (1965).

Usnea implicita (Stirt.) Zahlbr. f. *creberrima* Asahina in Journ. Jap. Bot. **41**: 161 (1966).

Darjeeling (2. IV. 1960); Victoria Fall-St. Paul School (8. IV. 1960). East Nepal: Sinduwa, 2000 m (21. X. 1963).

f. **subcreberrima** (Asahina) Asahina, comb. nov.

Usnea implicita (Stirt.) Zahlbr. f. *subcreberrima* Asahina in Journ. Jap. Bot., **41**: 162 (1966).

Loci ut in f. *creberrima* (Asahina) Asahina.

Subgenus Euusnea Jatta

The *Usnea Thomsonii* group.

Usnea Thomsonii Stirt.: Motyka, Monograph. 615 (1938).

Darjeeling: Senchal (16. IV. 1960); Phalut, 3000 m (9. V. 1960); Phalut (11. V. 1960); Phalut, 3500 m (2–5. VI. 1960); Phalut–Sandakphu (6. VI. 1960). Sikkim: Jongri (20. V. 1960); Migothang, 3900 m (30–31. V. 1960); Gamothang, 3750 m (30. V. 1960); Migothang–Nayathang (1. VI. 1960). E. Nepal: Tharpu near Chyangthaphu (27. X. 1963); Dumhan–Taplejung (1. XI. 1963); Walunchung Gola–Zongi (11. XI. 1963); below Siling Tzokupa (21 XI. 1963); Birwa–Yektin (28. XI. 1963).

According to Motyka the medullary reaction of *U. Thomsonii* is K–. The present writer has found that the medullary reaction of P is sometimes+yellow, which is the case more frequently on the medulla of receptacles. This is due to the presence of psoromic acid. Also the writer has found barbatic acid in specimens K–, P–.

subsp. **arborea** (Stirt.) Motyka, Monograph. 617 (1938).

Darjeeling, 2000 m (2. IV. 1960); Senchal (6. IV. 1960); Senchal, 2400 m (16–23. IV. 1960); Phalut (5–10. V. 1960). Sikkim: Bakkim–Preig Chu (19. V. 1960); Jongri (21. V. 1960); Tendong Peak, 2700 m (26. III. 1963). E. Nepal: Sinduwa–Bilbatay (23. X. 1963); Bilbatay Bhanjang, etc. (27. X. 1963); Tharpu near Chyangthaphu (27. X. 1963); Hati Sar–Mangalbare, etc. (28. X. 1963); Batasay–Halhale Bhanjang (1–2. XII. 1963); Bhuspate Dhanra, etc. (2. XII. 1963).

Motyka segregated this subspecies from the type above all by the medullary reaction " K+ distincte rubescente ". The present writer could select such specimens and identified that substance (K+) with salacinic acid.

Usnea dendritica Stirt.: Motyka, Monograph. 617 (1938).

Darjeeling: Phalut (5. VI. 1960). Sikkim: Jongri (20–22. V. 1960); Gamothang (30. V. 1960); Migothang (31. V. 1960; Migothang–Nayathang (1. V. 1960).

A robust plant difficult to distinguish from *Usnea Thomsonii* Stirt. According to Motyka the medullary reaction of this species is " K sensim et indistincte rubescens ". He adds the following points to the differentiation of *Usnea dendritica*: deep chesnut-brown thallus, absence or very few occurrence of white pseudocyphellae, narrow medulla and thick axis.

Usnea sordida Motyka, Monograph. 619 (1938).

Darjeeling, 200 m (2. IV. 1960); Senchal (6–16. IV. 1960).

The writer hesitates to adopt the Motyka's expression " tomentellus " of the thalline surface of the specimens determined by Motyka.

Usnea cf. **cineraria** Motyka, Monograph. 618 (1938).

Darjeeling: Takdah (18. IV. 1960).

Thallus cinereofuscescens, pseudocyphellis nullis; medulla K+ rubescens, P+ lutescens. Acidum usnicum et acidum salacinicum continens.

Usnea subsordida Stirt.

Darjeeling, 2000 m (2 & 8. IV. 1960); Senchal (6. I. 1960); Takdah (18. IV. 1960); Rimbick (6. V. 1960); Phalut (10. V. 1960). Sikkim: Jongri (20. V. 1960); Migothang–Nayathang (1. VI. 1960). E. Nepal: Bilbatay Bhanjang, etc. (27. X. 1963); Minchin Dhap (29. X. 1963); Walunchung Gola (10. XI. 1963); below Siling Tzokupa (21–22. XI. 1963); Birwa–Yektin (28. XI. 1963); Batasay–Halhale Bhanjang, etc. (1. XII. 1963); Bhuspate Dhanra, etc. (3. XII. 1963).

Motyka mentions *Usnea subsordida* is rather a small plant (" thallus ca 4 cm longus "). But its photograph in natural size taken by Motyka reveals more larger habit. Though Motyka arranged it in Sect. Glabratae, subsect. Scabridae, its belonging to sect. Albomaculatae of the Sect. Dendriticae will be justified by the presence of pseudocyphellae.

Usnea pseudosinensis Asahina, sp. nov.

Thallus ca 10 cm longus; cinereoviridis, in herbario cinereo vel stramineo fuscescens, opacus, ad ramulos pallidior, basi attenuata obscurata, mox supra basin subsympodialiter ramosus, ramis secundariis varidioribus, axillis rectis. Rami leviter curvati, ad basin attenuati, ceterum inflatulo-incrassati, ad apices sensim subulato attenuati, rare fracti vel articulati, medio usque ad 3 mm crassi, teretes, papillati, papillis obtusiusculis, fere concoloribus et maculis albidis farinosis, ecorticatis, leviter elevatis, pseudocyphelliformibus oblongis vel irregularibus sat crebre vel sat rare sparsi. Ramuli crebri, 2–10 mm longi, verruculosi. Apothecia crebra, terminaria, 4–10 mm lata, concava; excipulum laeve et laeviter lacunosum. Cilia sat crebra, ad basin non constricta. Discus carneus, vulgo albo pruinosus. Sporae ellipsoideae 13 × 8 μ.

Darjeeling: Senchal, 2400 m (6. IV. 1960—typus TNS, TI). Sikkim: Gamothang (29. V. 1960). E. Nepal: Hati Sar, etc. (28. X. 1963); Walunchung Gola–Zongi (11. XI. 1963); Siling Tzokupa (21. XI. 1963); Batasay–Halhale Bhanjang (1. XII. 1963).

RS- and AQ-values:

1) thickness of branch 1.9 mm. c:m:a = 100:700:300(μ) AQ = 16%

2) " " 1.5 mm. c:m:a = 70:600:200(μ) AQ = 13%

Reaction.: medulla K–, P–vel flava. Acidum usnicum, acidum barbaticum et acidum psoromicum continens. The contents of psoromic acid is sometimes so small, that it is hardly demonstrable by the microcrystallization. External appearance closely resembles *Usnea subsordida* Stirt., but it is distinguished from the latter by the difference of chemical contents. This new species resembles also Ethiopian *Usnea albomaculata* Mot., which differs by the different combination of chemical ingredients: usnic acid and norstictic acid.

The *Usnea orientalis* group

Usnea orientalis Motyka, Monograph. 547 (1938).

cf. Asahina, Lich. Japan **3**: 100 (1956).

Darjeeling: Senchal (6. IV. 1960). Sikkim: Gangtok (13. VI. 1960); Preig Chu (19. V. 1960).

Medulla laxissima, hyphis arachnoideis, K mox rubens, P lutescens. Acidum usnicum et acidum salacinicum continens.

Motyka's description in Monograph., p. 548 "—soredia farinosa—" is unnecessary and to be omitted.

Usnea sinensis Motyka, Monograph 248 (1936).

Sikkim: Jongri, 4000 m (22. V. 1960); Gamothang, 3900 m (29. V. 1960).

Medulla sat laxa et hyphis arachnoideis, K–, P–.

The *Usnea ceratina* group

Usnea nipparensis Asahina, Lich. Japan **3**: 91 (1956).

Darjeeling: Rimbick (8. V. 1960); Phalut (9. V. 1960); Phalut-Sandakphu (6. VI. 1960). Sikkim: Pamianchi (13. V. 1960); Migothang-Nayathang (1. VI. 1960). E. Nepal: Walunchung Gola-Zongi (11. XI. 1963); Bhuspate Danra-Bhandukay (2. XII. 1963).

On the basis of Japanese specimens this species was established as a distinct member of the *Usnea ceratina* group. Afterwards its occurrence was confirmed in Formosa, Corea and also in Nepal Himalaya.

Usnea fragilis Stirt.: Motyka, Monograph. 355 (1938).

Darjeeling (8. IV. 1960); Lopchu (28. IV. 1960); Rimbick (6. V. 1960). Sikkim: Pamianchi (13. V. 1960).

Thallus omnino dichotome ramosus.

Usnea roseola Vain. in Bot. Mag. Tokyo **30**: 46 (1921)-Asahina, Lich. Japan, **3**: 103 (1956).

Darjeeling: Senchal, 2400 m (6. IV. 1960). Sikkim: Gangtok (13–15. VI. 1960). E. Nepal: Bilbatay Bhanjang–Tutay (27. X. 1963).

Thallus vulgo sympodialiter ramosus.

The *Usnea articulata* group.

Usnea flexilis Stirt.

Darjeeling: Ramam (8. V. 1960); Phalut, 3000 m (9–11. V. 1960). Sikkim; Migothang–Nayathang (1. VI. 1960). E. Nepal: Chyangthaphu–Birwa (27. X. 1963); Hati Sar–Mangalbare (28. X. 1963); below Siling Tzokupa (21. XI. 1963); Khebang, 1400 m (23. XI. 1963); Batasay–Halhale Bhanjang (1. XII. 1963).

The main branches of our specimens are much thicker than those of Motyka's report (1.0–1.4 mm). According to the latter author, the medullary reaction of this species is " K leviter flavescens ". On the contrary Stirton mentions " fibrillae medullares K fl. dein rufo ferruginea vel rubentes ". The present author has found the same result as Stirton and confirmed the presence of salacinic acid.

Usnea Stirtoniana Zahlbr.

Darjeeling (8. IV. 1960); Rimbick (8. V. 1960); Phalut (9. V. 1960); Phalut (5. VI. 1960); Phalut–Sandakphu (6. VI. 1960). E. Nepal: Bilbatay Bhanjang–Tutay (27. X. 1963); Hati Sar–Mangalbare (28. X. 1963); below Siling Tzokupa (21. XI. 1963).

The medullary reaction of typical specimens are K+yellow, P miniate and they contain stictic acid together with usnic acid.

Norstictic acid Strain.

Morphologically identical with *Usnea Stirtoniana* Zahlbr., but contains norstictic acid instead of stictic acid: med. K+yellow soon becoming red and yields fine reddish needles by K (norstictic acid). One specimen from Darjeeling–Phalut contains besides norstictic and usnic acids a fatty substance crystalizing in long colorless needles.

Darjeeling: Phalut (10. V. 1960); Phalut (5. VI. 1960). E. Nepal: Batasay–Halhale Bhanjang (2. XII. 1963).

The *Usnea rubicunda* group.

Usnea rubicunda Stirt.

Darjeeling (2–8. IV. 1960); Senchal (6. IV. 1960); Kurseong (12. IV. 1960); Takdah (18. IV. 1960); Lopchu (28. IV. 1960). Sikkim: Pamianchi (13. V. 1960); Yoksam (17. V. 1960); Gangtok (14. VI. 1960). E. Nepal: Sinduwa, 2000 m (21. X. 1963); Murhay–Bilbatay Bhanjang (25. X. 1963).

A full-grown individual attains up to 20 cm long, and basal branches up to 2 mm thick.

Usnea rubescens Stirt.

East Nepal: Minchin Dhap–Mul Pokhari (29. X. 1963).

Usnea aciculifera Vain. in Bot. Mag. Tokyo **35**: 45 (1921)-Motyka, Monograph. 322 (1938)-Asahina, Lich. Japan **3**: 74 (1956).

Darjeeling (2–8. IV. 1960); Takdah (18. IV. 1960); Lopchu(28. IV. 1960); Rimbick (6. V. 1960). Sikkim: Pamianchi (13. V. 1960); Yoksam (17. V. 1960); Gangtok (13–15. VI. 1960). E. Nepal: Sinduwa (21. X. 1963); Bilbatay Bhanjang, 2200 m (25–27. X. 1963); Minchin Dhap–Mul Pokhari (29. X. 1963); Helok–Baroya Khimty (15. XI. 1963); Birwa–Yektin (28. XI. 1963); Minchin Dhap–Mul Pokhari (29. XI. 1963); Helok–Baroya Khimty (15. XI. 1963).

Usnea galbinifera Asahina in Journ. Jap. Bot. **38**: 257 (1963).

Darjeeling: Rimbick (2. V. 1960); Phalut–Sandakphu (10. V. 1960—typus). Sikkim: Jongri (20. V. 1960).

var. **subfibrillosa** Asahina, var. nov.

Thallus crebre fibrillosus, ceterum ut in typo.

E. Nepal: Bilbatay Bhanjang, 2200 m (25. X. 1963—typus TNS, TI); Dumhan–Taplejung (2. XI. 1963).

Usnea bismolliuscula Zahlbr.

Darjeeling: Senchal (6. IV. 1960); Takdah (18. IV. 1960).

The *Usnea longissima* group

Usnea pectinata Tayl. (1847)-Motyka, Monograph. 422 (1938)-Asahina in Journ. Jap. Bot. **40**: 1 (1965).

U. Hossei Vain. (1921)

Darjeeling: Senchal (16. IV. 1960).

Usnea montis-Fuji Motyka, Monograph. 420 (1938).

cf. Asahina, Lich. Japan **3**: 49 (1956).

Darjeeling: Rimbick 2200 m (6. V. 1960); Phalut (9. V. 1960). E. Nepal: Bilbatay Bhanjang–Hati Sar (26. X. 1963); Birwa–Yektin (28. XI. 1963).

Usnea pseudomontis-Fuji Asahina, Lich. Japan **3**: 51 (1956).

Darjeeling: Phalut (9. V. 1960). E. Nepal: below Siling Tzokupa (21. XI. 1963).

Usnea longissima Ach.: Motyka, Monograph. 423 (1938)–Asahina, Lich. Japan **3**: 46–49 (1956).

var. **vulgata** Asahina

Sikkim: Olothang–Jongri (23. V. 1960); Migothang (30–31. V. 1960). Darjeeling: Phalut–Sandakphu, 3500 m (6. IV. 1960). E. Nepal: below Siling Tzokupa–Siling Tzokupa (21. XI. 1963).

Acidum usnicum et acidum barbaticum continens.

subsp. **jesoensis** Asahina

Darjeeling: Phalut (9. V. 1960); Rimbick (8. V. 1960). Sikkim: Gamothang, 3900m (29. V. 1960). E. Nepal: Selap–Walunchung Gola (10. XI. 1963); Walunchung Gola–Zongi (11. XI. 1963).

Acidum usnicum et acidum evernicum continens.

subsp. **ambigua** Asahina

Darjeeling: Phalut (5. V. 1960); Phalut–Sandakphu (6. VI. 1960). Sikkim: Jongri (20. V. 1960). E. Nepal: Selap–Walunchung Gola (10. XI. 1963); Bilbatay Bhanjang–Hati Sar (27. X. 1963).

Acidum usnicum et acidum diffractaicum continens.

subsp. **sensibilis** Asahina

E. Nepal: Birwa–Yektin (28. XI. 1963).

Acidum usnicum et acidum salacinicum continens.

subsp. **dubia** Asahina, subsp. nov.

Acidum usnicum et materiam decolorem peculiarem continens.

Darjeeling: Phalut–Sandakphu (5–6. VI. 1960—typus TNS, TI). Sikkim: Jongri (20 V. 1960); Olothang–Jongri (23. V. 1960). E. Nepal: Mangalbare, etc. (28. X. 1963); Walunchung Gola–Zongi (11. XI. 1963).

By the ordinary microcrystallization usnic acid only was confirmed, neither depside nor depsidone. Generally in ether extract a fatty substance occurs, which crystallizes in broad thin colorless plates and exhibits the same Rf value (T.L.C. by Miss Nuno) with the fatty substance occurring in *Cetraria Togashii* Asahina.

On the basis of Zopf's opinion formerly it became a common sense to accept the barbatic acid as the characteristic ingredient of *Usnea longissima* Ach. But, as the present writer has already shown, the socalled *Usnea longissima* inculudes a group of morphologically identical and chemically different individuals, which may be distinguished by arranging into different subspecies or by affixing the attribute of different strains in the sense of Lamb. On this subject, the writer is preparing a detaliled paper to be published in the near future.

Oropogon formosanus Asahina in Journ. Jap. Bot. **27**: 242 (1952).

Sikkim: Jongri (20. V. 1960). E. Nepal: Bilbatay Bhanjang–Tutay (27. X. 1963); Batasay–Halhale Bhanjang, etc. (1. XII. 1963).

Med. K–, P+red, contains protocetraric acid.

Siphula ceratites (Wnbg.) E. Fr. var. **himalayensis** Räs., teste Awasthi.

Sikkim: Migothang, 3900 m (30. V. 1960).

Med. K–, P–, contains usnic acid and zeorin.

Thamnolia vermicularis (Sw.) Ach.

Sikkim: Jongri, 4000 m (21–22. V. 1960); Olothang–Jongri (23. V. 1960).

Evernia mesomorpha Nyl.

Sikkim: Jongri (22. V. 1960). Darjeeling: Phalut–Sandakphu, 3300 m (6. VI. 1960).

f. **esorediosa** Müll. Arg.

Sikkim: Gamothang (29. V. 1960).

Alectoria virens Tayl.

Darjeeling: Phalut, 3000 m (9. V. 1960). E. Nepal: below Siling Tzokupa–Siling Tzokupa (21. XI. 1963); Batasay–Bhuspate Danra (2. XII. 1963); Hati Sar–Minchin Dhap (28. X. 1963).

The specimen collected in Phalut is only faintly colored yellowish. The writer is of opinion that this specimen is an intermediate form between the type and the following var. *decolorans* Asahina.

var. **decolorans** Asahina, var. nov.

Thallus pendulus, usque ad 30 cm (vel ultra) longus, cinereofuscescens, apicibus obscure fuscescens, ramus principalis applanatus, longitudinaliter sulcatus, sulcis interdum late hiantibus et medulla denudata, crebre subdichotome et sympodialiter ramosus, secundarius tertiariusque fere teretes, fuscescentes, ramuli laterales sat crebra, tenues, 1–3 mm longi, denigrati. Apothecia et pycnoconidia ignota. Med. K–, P+aurantiaca.

Darjeeling: Phalut (9. V. 1960—typus TNS, TI). East Nepal: Bilbatay Bhanjang-Tutay, etc. (27. X. 1963).

External appearance of this variety reminds us of the decolorized *Alectoria virens*.

Alectoria sulcata (Lév.) Nyl.

Darjeeling: Rimbick (8. V. 1960); Phalut–Sandakphu (6. VI. 1960). Sikkim: Jongri (20. V. 1960).

f. **ciliata** Hue, Linchenes Extra-Europaei no. 177.

Sikkim: Migothang (30. V. 1960); Singalila–Nayathang (2. VI. 1960). Darjeeling: Phalut–Sandakphu, 3500 m (6. VI. 1960). E. Nepal: Hati Sar–Mangalbare, etc. (28. X. 1963); Selap–Walunchung Gola (10. XI. 1963); below Siling Tzokupa-Siling Tzokupa (21. X. 1963); Birwa–Yektin (2. XI. 1963); Halhale Bhanjang-Mai Majuwa (1. XII. 1963); Bhuspate Danra, 2600 m (2. XII. 1963).

Alectoria asiatica Du Rietz

Sikkim: Jongri (20. V. 1960); Olothang, 3500 m (23. V. 1960); Migothang, 3900 m (30. V. 1960). Darjeeling: Phalut (10. V. 1960). E. Nepal: Bilbatay Bhanjang, 2200 m (26. X. 1963); Walunchung Gola-Zongi (11. XI. 1963); below Siling Tzokupa–Siling Tzokupa (21. XI. 1963); Birwa–Yektin (28. XI. 1963); Bhuspate Danra, 2600 m (2. XII. 1963).

Alectoria acanthodes Hue, Lichenes Extra-Europaei no. 175.

Darjeeling: Phalut (10. V. 1960). Sikkim: Jongri–Gamothang (26. V. 1960). E. Nepal: Hati Sar–Mangalbare, etc. (28. X. 1963); Walunchung Gola–Zongi (11. XI. 1963); below Siling Tzokupa–Siling Tzokupa (21. XI. 1963); Birwa–Yektin (28. XI. 1963); Batasay-Bhuspate Danra (1. XII. 1963).

Alectoria cf. **bicolor** Nyl. var. **melaneira** Nyl.

Darjeeling: Phalut (10–11. V. 1960). Sikkim: Jongri, 4000–4100 m (21–22. V. 1960); Olothang-Jongri (23. V. 1960); Jongri–Gamothang (26. V. 1960); Gamothang, 3900 m (29. V. 1960); Migothang (30. V. 1960).

Ramalina Ach. Sect. Euramalina Vain.

Subsect. Fistularia Vain.

Ramalina himalayensis Räs. in Arch. Soc. Zool. Bot. Fenn. "Vanamo" **5**: 26 (1950).

Darjeeling: Phalut, 3500 m (10. V. 1960); Phalut (2 & 6. VI. 1960). Sikkim: Migothang (30. V. 1960).

Subsect. Myelopoea Vain.

Ramalina sinensis Jatta

Darjeeling: Senchal (6. IV. 1960). E. Nepal: Sinduwa–Bilbatay Bhanjang (23. X. 1963).

Ramalina calicaris (L.) Röhl.

f. **papillosa** Hue, Lich. Extra-Europaei no. 159.

Darjeeling: Senchal (6. V. 1960); Phalut (10. V. 1960). Sikkim: Jongri (20. V. 1960); Penlong La, 2100 m (18. III. 1963). E. Nepal: Bilbatay Bhanjang, etc. (27. X. 1963); Hati Sar–Mangalbare, etc. (28. X. 1963); Minchin Dhap–Mul Pokhari (29. X. 1963); Dumhan–Taplejung (1. XI. 1963); Walunchung Gola–Zongi (11. XI. 1963); below Siling Tzokupa (21. XI. 1963); Birwa–Yektin (28. XI. 1963); Batasay–Halhale Bhanjang, etc. (1. XII. 1963).

var. **subfastigiata** Nyl., Lich. Extra-Europaei no. 159.

Darjeeling (2 & 8. IV. 1960); Senchal (6. IV. 1960); Kurseong, 1500 m (12. IV. 1960); Takdah (18. IV. 1960); Lopchu (28. IV. 1960); Rimbick (6. V. 1960); Phalut (9–10. V. 1960). Sikkim: Pamianchi (13. V. 1960); Preig Chu (19. V. 1960); Olothang (23. V. 1960. E. Nepal: Sinduwa–Bilbatay Bhanjang (23. X. 1963); Chyangthaphu–Birwa (27. X. 1963); Bilbatay Bhanjang, etc. (27. X. 1963); Birwa–Yektin (29. X. 1963); Selap–Zongi (10. XI. 1963); Batasay–Halhale Bhanjang, etc. (2. XII. 1963).

Ramalina farinacea Ach.

Darjeeling: Senchal (6. IV. 1960); Lopchu (28. IV. 1960); Rimbick (6. V. 1960); Sandakphu, 3400 m (6. VI. 1960). Sikkim: Jongri (20. V. 1960); Gangtok (13. VI. 1960). East Nepal: Bilbatay Bhanjang, etc. (27. X. 1963); Hati Sar, etc. (28. X. 1963); Selap–Walunchung Gola (10. XI. 1963); Birwa–Yektin (29. XI. 1963).

var. **reagens** Bouly de Lesd. in Bull. Soc. Bot. France **67**: 217 (1920)

Darjeeling: Lopchu (28. IV. 1960).

Medulla K rubescens, acidum salacinicum continens.

var. **multifida** Ach.

Darjeeling: Senchal (6. IV. 1960); Darjeeling (8. IV. 1960): Takdah (18. IV. 1960); Phalut, 3500 m (10. V. 1960). Sikkim: Pamianchi (13. V. 1960); Jongri (20. V. 1960); Phalut–Sandakphu (6. VI. 1960); Phalut (9. VI. 1960). E. Nepal: Murhay–Bilbatay Bhanjang (25. X. 1963); below Siling Tzokupa–Siling Tzokupa (21–22 XI. 1963); Batasay–Halhale Bhanjang, etc. (1. XII. 1963).

ANAPTYCHIAE and PARMELIAE (by Syo Kurokawa)

Anaptychia angustiloba (Müll. Arg.) Kurok. in Nova Hedwig. Beih. **6**: 39 (1962).

Darjeeling (Apr. 2, 1960); Kurseong (Apr. 12, 1960).

Anaptychia Awasthii Kurok., l. c. 88 (1962).

Darjeeling (Apr. 16, 1960). Sikkim: Pamianchi (May 13, 1960).

Anaptychia comosa (Eschw.) Mass.

Sikkim: Pamianchi (May 13, 1960).

Anaptychia dendritica (Pers.) Vain. var. **dendritica**

Darjeeling: Senchal (Apr. 6, 1960).

var. **propagulifera** Vain.

Darjeeling (Apr. 2, 1960); Senchal, Darjeeling (Apr. 6, 1960); Kurseong (Apr. 12, 1960); Takdah (Apr. 18, 1960).

Anaptychia diademata (Tayl.) Kurok., l. c. 28 (1962).

Darjeeling (Apr. 2 & 28, 1960); Kurseong, 1500 m (Apr. 12, 1960); Senchal, Darjeeling (Apr. 16, 1960); Takdah (Apr. 18, 1960); Phalut, 3500 m (Jun. 5, 1960). Sikkim: Phalut-Dentam (May 11, 1960); Migothang (May 31, 1960); Nayathang (Jun. 1, 1960); Gangtok (Jun. 15, 1960).

Anaptychia dissecta Kurok. (1959); l. c. 38 (1962) var. **dissecta**

Darjeeling (Apr. 2, 1960); Senchal, Darjeeling (Apr. 6, 1960).

var. **koyana** Kurok.

Darjeeling: Takdah (Apr. 18, 1960); Lopchu (Apr. 28, 1960).

Anaptychia firmula (Nyl.) Dodge et Awasthi

Darjeeling: Takdah (Apr. 18, 1960). Sikkim: Gangtok, 1600 m (Jun. 13, 1960).

Anaptychia incana (Stirt.) Zahlbr.

Darjeeling (Apr. 2, 1960); Senchal, Darjeeling (Apr. 6, 1960); Takdah (Apr. 18, 1960). Sikkim: Pamianchi (May 13, 1960); Bakkim-Jongri (May 20, 1960); Nayathang (Jun. 1, 1960).

Anaptychia leucomelaena (L.) Mass.

Darjeeling (Apr. 2, 1960).

Anaptychia neoleucomelaena Kurok. var. **neoleucomelaena**, l. c. 77 (1962)

Darjeeling: Phalut (May 10, 1960).

var. **squarrosa** (Vain.) Kurok., l. c. 78 (1962).

Darjeeling: Senchal (Apr. 6, 1960); Darjeeling (Apr. 8 & 16, 1960); Rimbick (May 6, 1960); Sandakphu (Jun. 6, 1960); Sandakphu–Tonglu, 3000 m (Jun. 7, 1960); Phalut (May 10, 1960). Sikkim: Bakkim–Jongri (May 20, 1960); Jongri (May 22, 1960); Olothang–Jongri (May 23, 1960).

Anaptychia obscurata (Nyl.) Vain.

Darjeeling (Apr. 2–8, 1960).

Anaptychia pellucida Awasthi

Darjeeling: Senchal (Apr. 16, 1960); Sikkim: Migothang (May 30, 1960); Migothang–Nayathang (Jun. 1, 1960).

Anaptychia pseudospeciosa Kurok. (1959); l. c. 25 (1962).

var. **pseudospeciosa**

Darjeeling: Senchal (Apr. 6, 1960).

var. **tremulans** (Müll. Arg.) Kurok., l. c. 26 (1962).

Darjeeling (Apr. 2–8, 1960). Sikkim: Gamothang (May 29, 1960).

Anaptychia punctifera Kurok., l. c. 45 (1962).

Darjeeling: Takdah (Apr. 18, 1960).

Anaptychia rubescens (Räs.) Kurok., l. c. 31 (1962).

Darjeeling (Apr. 2–8, 1960); Kurseong, 1500 m (Apr. 12, 1960); Takdah (Apr. 18, 1960). Sikkim: Gangtok, 1600 m (Jun. 14, 1960).

Anaptychia Togashii Kurok., l. c. 68 (1962).

Sikkim: Bakkim–Jongri (May 20, 1960); Jongri, 4000 m (May 21, 1960—holotypus in TNS and istotypus in TI and US); Jongri (May 22, 1960); Olothang-Jongri (May 23, 1960); Jongri–Base Camp, 4500 m (May 25, 1960); Jongri–Gamothang (May 26, 1960); Gamothang (May 29, 1960); Nayathang (Jun. 1, 1960); Migothang (Jun. 1, 1960).

Parmelia adaugescens Nyl.

Sikkim: Gamothang (May 29, 1960).

Parmelia adducta Nyl.

Darjeeling: Senchal (Apr. 16, 1960).

Parmelia aptata Krempelh.

Darjeeling: Observatory Hill (Apr. 2, 1960); Darjeeling (Apr. 8, 1960); Senchal (May 6, 1960). Sikkim: Pamianchi (May 13, 1960). E. Nepal: Dhankuta, 1200 m (Oct. 20 & 21, 1963); Dhara Pani–Illam (Dec. 5, 1963).

Parmelia aurulenta Tuck.

Darjeeling: Lopchu (Apr. 28, 1960). Sikkim: Yoksam (May 17, 1960).

Parmelia austrosinensis Zahlbr.

E. Nepal: Dhankuta, 1200 m (Oct. 21, 1963).

Parmelia boliviana Nyl.

Darjeeling: Kurseong, 1500 m (Apr. 12, 1960).

Parmelia caperata (L.) Ach.

Darjeeling: Senchal (Apr. 6, 1960).

Parmelia cirrhata Fr.

Sikkim: Tendong Peak, 2700 m (Mar. 26, 1963).

Parmelia dissecta Nyl.

Darjeeling (Apr. 2, 1960); Senchal, Darjeeling (Apr. 6, 1960).

Parmelia ecaperata Müll. Arg.

E. Nepal: Iladanda–Selap (Nov. 9, 1963).

Parmelia exsecta Tayl.

Darjeeling (Apr. 2, 1960); Senchal, Darjeeling (Apr. 6, 1960); Phalut (May 10, 1960). E. Nepal: Bhuspate Danra, 2600 m (Dec. 2, 1963).

Parmelia formosana Zahlbr.

Darjeeling (Apr. 2, 1960); Senchal, Darjeeling (Apr. 6, 1960).

Parmelia flexilis Kurokawa, sp. nov. [Fig. 45]

Thallus corticola, laxe adnatus, albido-cinerascens, plus minusve flexilis, irregulariter lobatus, isidiis sorediisque destitutus, 3–5 cm diametro, subtus niger et modice vel dense rhizinosus, rhizinis nigris, dichotome ramosis. Apothecia numerosa, adnata; sporae 8–11 × 15–21 μ.

Thallus loosely adnate on twigs, more or less flexible, pearl grey, turning deep-

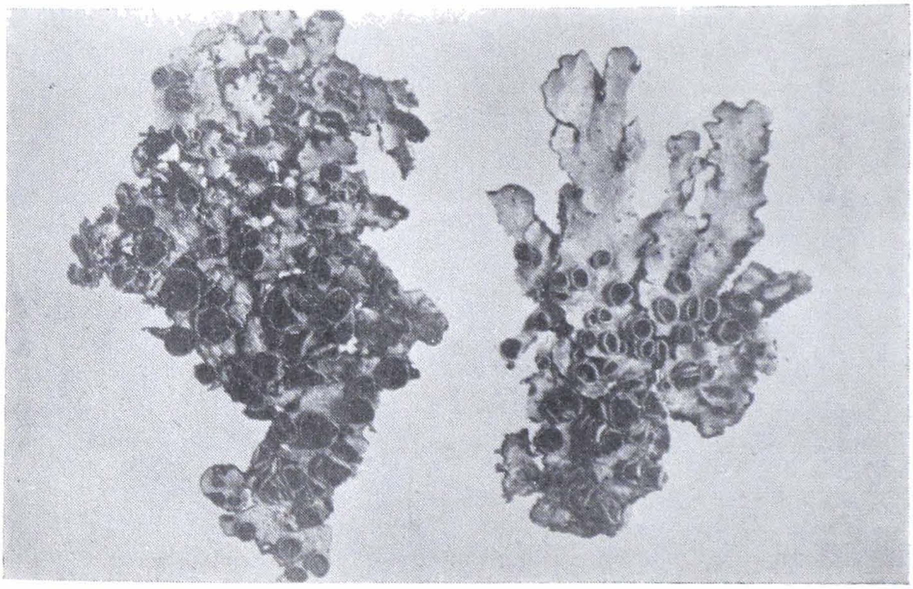

Fig. 45. *Parmelia flexilis* Kurokawa, × 1.2. Holotypus.

olive-buff in the herbarium, 3–5 cm in diameter, lobes irregularly branched, 3–6 mm wide, margins more or less crenate, uppersurface plane and smooth, more or less shiny, sometimes faintly maculate, isidia and soredia lacking; medulla white; undersurface black, moderately or densely rhizinate, rhizines black, shiny, moderately branched, 0.2–0.4 mm long. Apothecia numerous, adnate, 2–6 mm in diameter; margins smooth, disc snuff-brown to bister; hymenium about 65–75 μ high; spores 8–11 × 15–21 μ.

Thallus K+ yellow; medulla P–, K–, C–, KC–. Atranorin and protolichesteric acid present.

Darjeeling: (Apr. 2, 1960); Senchal, 2400 m (H. Hara et al. Apr. 6, 1960—holotypus in TNS and isotypus in TI).

Externally this new species resembles *P. keitauensis* Asah. They both have fairly large spores and lack isidia. While *P. keitauensis* has positive color reaction with P in the medulla, producing protocetraric acid, however, the medulla of *P. flexilis* is P–. *Parmelia flexilis* seems to be a rare species distributed in tropical eastern Asia and New Guinea.

Additional specimens examined. Formosa. Taitung Pref.: Bayu Lake, about 2200 m. Jan. 21, 1965. *S. Kurokawa* 2396 (TNS) and 2398 (TNS). New Guinea. Al River Valley NW of Nondugl, West Highland District. Alt. 2000 m. Apr. 3, 1953. *R. D. Hoogland* 3208 (TNS).

Parmelia imbricatula Zahlbr.

E. Nepal: Helok–Baroya Khimty (Nov. 15, 1963).

Parmelia incognita Kurokawa, nom. nov. [Fig. 46]

Parmelia koyaensis f. *inactiva* Asah. in Journ. Jap. Bot. **28**: 68 (1953)–lectotypus. Japan. Prov. Sagami: Moto-Hakone (Aug. 12, 1925. *Y. Asahina* 2033, TNS).

Darjeeling: Batasi (May 6, 1960); Rimbick (May 6, 1960).

In 1959 Asahina reduced *P. koyaensis* f. *inactiva* as a synonym of *P. nodakensis* Asah. When Asahina described *P. koyaensis* f. *inactiva*, however, he cited four

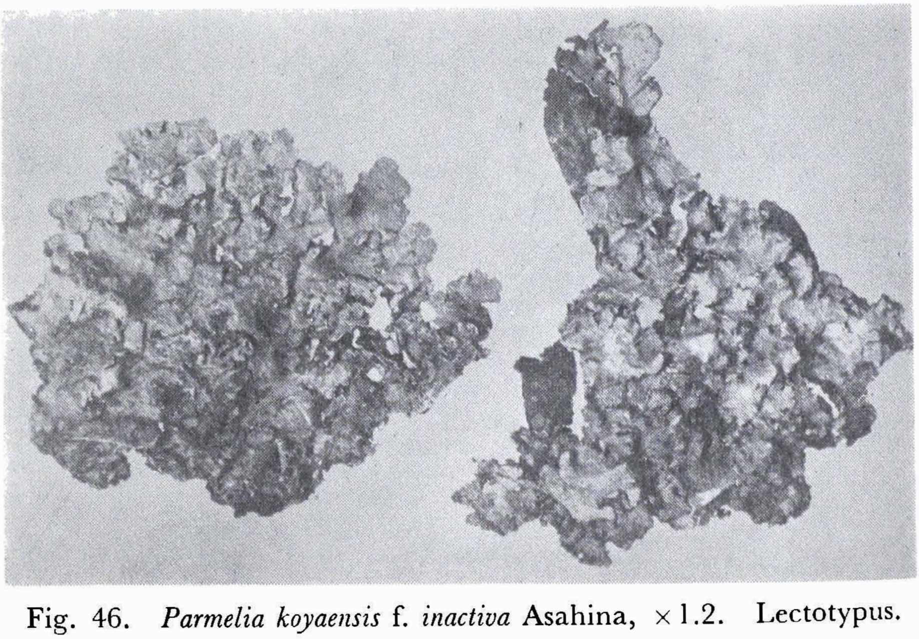

Fig. 46. *Parmelia koyaensis* f. *inactiva* Asahina, × 1.2. Lectotypus.

specimens: Moto-Hakone, Prov. Sagami; Mt. Koya and Tanabe, Prov. Kii; Nippara, Prov. Musashi. A specimen collected at Nippara has negative color reaction with C and KC and the lower surface has a rather broad naked zone. Therefore, this specimen can be identified with *P. Ikomae* Asah. A specimen from Tanabe, Prov. Kii is apparently *P. subaurulenta*, because of the pale yellow medulla and the presence of atranorin and zeorin. The medulla is C– and KC– in a specimen collected on Mt. Koya, which is identified with *P. infirma* Kurok. The other specimen, designated here as the lectotype of *P. koyaensis* f. *inactiva*, shows pale rose color reaction with C and contains gyrophoric acid along with atranorin and protolichesteric acid. In contrast, the medulla of *P. nodakensis* is C–, but KC+rose, containing unknown substances.

The specific epithet *inactiva* is preempted by *Parmelia inactiva* (Zahlbr.) Vain., a synonym of *P. saccatiloba* Tayl.

Parmelia infirma Kurok. in Hale et Kurokawa in Contr. U. S. Nat. Herb. **36**: 179 (1964).

Darjeeling: Kurseong (Apr. 2, 1960, H. Hara et al.—holotypus in TNS and isotypus in TI and US); Takdah (Apr. 18, 1960); Rimbick (May 6, 1960).

When *P. infirma* was described, it was known only from the type locality (see above). However, this species is now known from Japan, Formosa, Thailand, and Indonesia. Therefore, this species is widely distributed in tropical or subtropical areas in eastern Asia.

Parmelia isidiza Nyl.

Darjeeling: Takdah (Apr. 18, 1960); Lopchu (Apr. 28, 1960).

Parmelia koyaensis Asah.

Darjeeling: Batasi (May 4, 1960); Rimbick (May 6, 1960).

Parmelia meizospora (Nyl.) Nyl.

Darjeeling (Apr. 2, 1960); Batasi (May 6, 1960). Sikkim: Pamianchi, 2000 m (May 13, 1960); Yoksam, 1800 m (May 17, 1960).); Gangtok, 1600 m (Jun. 14, 1960).

Parmelia nepalensis Tayl.

Darjeeling: Senchal, 2400 m (Apr. 16, 1960); Lopchu (Apr. 28, 1960). Sikkim: Yoksam, 1800 m (May 17, 1960); below Bakkim (May 19, 1960); Jongri (May 20, 1960); Jongri, 4000 m (May 22, 1960); Gamothang, 3900 m (May 29, 1960). E. Nepal: Walunchung Gola–Zongi (Nov. 11, 1963).

Parmelia nilgherrensis Nyl.

Darjeeling: Rimbick (May 6, 1960). E. Nepal: Bilbatay Bhanjang, 2200 m (Oct. 26, 1963); below Siling Tzokupa–Siling Tzokupa (Nov. 21, 1963); Halhale Bhanjang–Bhuspate Danra (Dec. 1, 1963); Bhuspate Danra, Taplejung Dist. (Dec. 2, 1963).

Parmelia perisidians Nyl.

Sikkim: Pamianchi (May 13, 1960).

Parmelia praesorediosa Nyl.

Darjeeling: Takdah (Apr. 18, 1960); Lopchu (Apr. 28, 1960). Sikkim: Yoksam, 1800 m (May 17, 1960).

Parmelia rampoddensis Nyl.

Darjeeling: Senchal (Apr. 6, 1960).

Parmelia reticulata Tayl.

Darjeeling (Apr. 2 & 8, 1960); Takdah (Apr. 18, 1960); Lopchu (Apr. 28, 1960).

Sikkim: Yoksam, 1800 m (May 17, 1960).

Parmelia rudecta Ach.

East Nepal: Iladanda-Selap (Nov. 9, 1963).

Parmelia sancti-angeli Lynge

Darjeeling: Kurseong, 1500 m (Apr. 12, 1960); Takdah (Apr. 18, 1960); Lopchu (Apr. 28, 1960). Sikkim: Pamianchi (May 13, 1960); Yoksam, 1800 m (May 17, 1960). E. Nepal: Dhankuta. 1200 m (Oct. 21, 1963).

Parmelia saxatilis Ach.

Sikkim: Olothang–Jongri (May 23, 1960).

Parmelia scytodes Kurok. in Hale et Kurok., l. c. 185 (1964).

Darjeeling: Batasi (May 6, 1960, Hara et al.—holotypus in TNS and isotypus in TI and US).

Parmelia scytophylla Kurok. in Hale et Kurok., l. c. 185 (1964).

Darjeeling: Phalut 3500 m (May 10 & Jun. 2, 1960); Sandakphu–Tonglu, 3000 m (Jun. 7, 1960). Sikkim: Migothang, 3900 m (May 30, 1960, H. Hara et al.—holotypus in TNS and isotypus in TI and US).

Parmelia setschwanensis Zahlbr.

Darjeeling: Senchal (Apr. 6, 1960); Darjeeling (Apr. 8, 1960); Kurseong, 1500 m (Apr. 12, 1960); Rimbick (May 6, 1960).

Parmelia subaurulenta Nyl.

Darjeeling: Phalut, 3000–3500 m (May 9 & 10, 1960).

Parmelia submutata Hue.

E. Nepal: Selap–Walunchung Gola (Nov. 10, 1963).

Parmelia subsumpta Nyl.

Darjeeling: Senchal (Apr. 6, 1960).

Parmelia subtinctoria Zahlbr.

E. Nepal: Dhankuta, 1200 m (Oct. 21, 1963).

Parmelia tinctorum Nyl.

Darjeeling (Apr. 2 & 8, 1960); Kurseong, 1500 m (Apr. 12, 1960); Takdah (Apr. 18, 1960); Lopchu (Apr. 28, 1960). Sikkim: Pamianchi, 2000 m (May 13, 1960); Yoksam, 1800 m (May 17, 1960); Gangtok, 1900 m (Jun. 13 & 14, 1960). C. Nepal: Kathmandu Airport (Oct. 13, 1963). E. Nepal: Dhankuta, 1200 m (Oct. 20 & 21, 1963); Hati Sar–Minchin Dhap (Oct. 28, 1963); Iladanda–Selap (Nov. 9, 1963); Helok–Baroya Khimty (Nov. 15, 1963); Bhuspate Danra, 2600 m (Dec. 2, 1963); Dhara Pani–Illam (Dec. 5, 1963).

Parmelia vexans Zahlbr.

Darjeeling (Apr. 2, 1960).

Parmelia Wallichiana Tayl.

Darjeeling (Apr. 2 & 8, 1960); Senchal, Darjeeling (Apr. 6 & 16, 1960); Kurseong, 1500 m (Apr. 12, 1960); Takdah (Apr. 18, 1960); Lopchu, (Apr. 28, 1960). Sikkim: Yoksam, 1800 m (May 17, 1960). E. Nepal: Dhankuta, 1200 m (Oct. 21, 1963); Bilbatay Bhanjang, 2200 m (Oct. 25, 1963); Selap–Walunchung Gola (Nov. 10, 1963); Helok–Baroya Khimty (Nov. 15, 1963).

Parmelia xantholepis Mont. et v. d. Bosch.

Darjeeling (Apr. 2, 1960); Kurseong, 1500 m (Apr. 12, 1960); Takdah, (Apr. 18, 1960); Rimbick (May 6, 1960).

FUNGI

by Rokuya Imazeki, Yosio Kobayasi, and Kiyowo Aoshima

The first systematic exploration of the Himalayan higher fungi was made by Sir J. D. Hooker in 1849–1850 during his botanical survey of the flora of India. The materials collected by his expedition were studied by M. J. Berkeley who published them in Hooker's Journal of Botany, vol. 1–5, 1850–1854, in his Decades of Fungi, XXV–XLIX.

Since then, there had been no important fungus investigations carried out until Dr. P. N. Mehra, Professor of Panjab University undertook the large-scaled investigation on the cryptogamic flora of the Mussoorie Hills in the North-Western Himalaya, at heights varying from 1,500 to 2,100 m. In this joint research, Prof. K. S. Thind and other Indian mycologists have been studying fungi, cooperated with British and N. American mycologists. They have published already fourty-two papers including 17 papers on Myxomycetes, 10 on Clavariaceae, 7 on Pezizaceae, 2 on Thelephoraceae, 4 on Polyporaceae and 2 on Helotiales until 1965. Besides them, Dr. E. Müller published several papers on the Himalayan Pyrenomycetes. Our knowledge of the mycology of the Himalayan region will be gradually enriched by their efforts.

The mycological contribution of Japanese mycologists to the Himalayan fungi was very few in the past. Very recently, Y. Kobayasi, reported the occurrence of *Calostoma Junghunii* (Schl. et Muell.) Massee and *Isaria japonica* Yasuda in Eastern Himalaya, based on the materials collected by the Botanical Expedition of University of Tokyo. In 1961, Y. Kobayasi, K. Tubaki and M. Sonoda also made the studies on moulds and a yeast isolated from the native's yeast cake called "murcha" which was used for brewing native beer (Kodok Jar) among the Sikkimese. On the other hand, in these ten years, the scientific expeditions to Himalaya were very actively made by Japanese scientists. Some of them collected fungus specimens of this region as their side work.

Dr. Teizo Ogawa, Professor Emeritus of the Faculty of Medicine, Tokyo University, collected about thirty specimens of wood inhabiting higher Basidiomycetes in Sorokung district, westward of Mt. Everest, East Nepal, in 1959–1960. Dr. Kyoji Yoda, the botanist in Kyoto University joined the Himalayan Expedition of Kyoto University and collected many kinds of woody Basidiomycetes in East Nepal. Mr. Naohiko Sagara, the only Japanese mycologist who visited Nepal, stayed from 1964 to 1965 at Kathmandu and made mycological studies. During his one year stay in Nepal, he collected many specimens and made the pure cultures of many kinds of higher fungi. Among them, many kinds of fleshy Agaricales were included and studied by him.

The present materials were collected by the Botanical Expeditions to Eastern Himalaya organized by the University of Tokyo, which were held in 1960 and 1963, respectively. The most specimens belong to hard and wood inhabiting

Basidiomycetes. The specimens were made in good condition and plenty enough to be studied. The authors could not accomplish their studies of them and there remain not a few undetermined specimens. In spite of this, the authors have learned a very interesting fact. That is the close relation existing between the fungus floras of both Japan and Himalaya. The examples are shown by the following fungi: *Isaria japonica* Yasuda, *Daedaleopsis purpurea* (Cooke) Imaz. et Aosh., *Inonotus xeranticus* (Berk.) Imaz. et Aosh. and *Pyrrhoderma adamantinum* (Berk.) Imaz. The former two were originally described from Japan and the latter two from the Eastern Himalaya. But at present, *Isaria japonica* and *Inonotus xeranticus* are known from Japan, Formosa and Himalaya, and *Daedaleopsis purpurea* and *Pyrrhoderma adamantinum* are definitely known only from Himalaya and Japan.

The writers wish to express their cordial thanks to the members of the present Botanical Expeditions to Eastern Himalaya for their tremendous efforts in collecting these valuable fungus specimens. By their efforts, the authors have had a good opportunity to study the fungus flora of this inaccessible area where is considered to be very important to the study of the Japanese fungus flora. They are also grateful to Mrs. Yoshiko Kobayashi for her constant help in making microscopic examinations and photomicrographs. Special thanks are due to Mr. Hisahiko Furukawa for the microscopic examination of some *Hymenochaete*.

ASCOMYCETES

Isaria japonica Yasuda in Bot. Mag. Tokyo **32**: 25 (1918)–Y. Kobayasi in Journ. Jap. Bot. **40**: 228, col. pl. V (1965).

Sikkim: Penlong La, 2100 m (Sep. 13, 1964, on adult insect of *Orthoptera*?)

Distr. Himalaya, Formosa, and Japan.

Trichocoma paradoxa Jungh. in Verh. Batavia, Genootschap **17**: 9 (1839)–Y. Kobayasi in Nagaoa **2**: 16 (1952).

Darjeeling: Rimbick, 2200 m (May 8, 1960).

Distr. Himalaya, S. E. Asia, Japan, C. America and New Zealand.

Xylaria polymorpha (Pers. ex St. Amans) Grev., Flor. Edinensis 355 (1824).

Sphaeria polymorpha Pers. ex St. Amans, Fl. Agenaise 520 (1821).

E. Nepal: Helok–Baroya Khimty (Nov. 15, 1963).

Distr. World-wide.

BASIDIOMYCETES

Auricularia polytricha (Mont.) Sacc., Misc. **2**: 12 (1885)–Y. Kobayasi in Bull. Cent. Nat. Mus. Manchoukuo **4**: 29 (1942).

Exidia polytricha Mont. in Belanger, Voy. Ind. Orient. 154 (1834).

Sikkim: Gangtok, 1750 m (Jun. 13, 1960, HF112; May 27, 1960, HF92).

Distr. Common in the tropical, subtropical and temperate regions except Europe.

Phellodon niger (Fr.) Karsten, Hattsv. **2**: 95 (1882).

Hydnum nigrum Fries, Syst. Myc. **1**: 404 (1821).

Darjeeling: Ramam, 2400 m (May 7, 1960, HF 91).

Distr. Common in the temperate and subfrigid regions.

Stereum frustulatum (Pers. ex Fr.) Fckl. in Jahrb. Nassau. Verein. f. Naturk. **15**: 102 (1861).

Thelephora frustulata Pers. ex Fr., Syst. Myc. **1**: 445 (1821).

Darjeeling: Palmajua, 2300 m (May 4, 1960, HF 122).

Distr. World-wide.

Stereum hirsutum Willd. ex Fries, Epicr. 549 (1838).

Sikkim: Bakkim, 2200 m (May 19, 1960, HF 2). Darjeeling: Rayang, 2500 m (Apr. 18, 1960, HF 18.)

Distr. World-wide.

Stereum ostrea (Blume et Nees) Fries, Epicr. 547 (1838).

Thelephora ostrea Blume et Nees in Nova Acta Acad. Caes. Leop. Car **13**: 13 (1826).

Stereum fasciatum (Schw.) Fr., Epicr. 546 (1838).

Darjeeling: Takdah, 1600–1700 m (Apr. 18, 1960, HFI).

Distr. World-wide.

Spores are hyaline, oblong, ellipsoid, smooth, 6–7×3–4 μ, amyloid; pseudocystidia hyaline, long clavate, 4–8 μ thick, with thick walls except the tip; context 350–550 μ thick, consisting of two kinds of hyphae, the one kind of hyphae thin walled, 3–5 μ thick, septate, fewly branched, running parallel, the other about same sized, but thick walled, running parallel but turning their direction

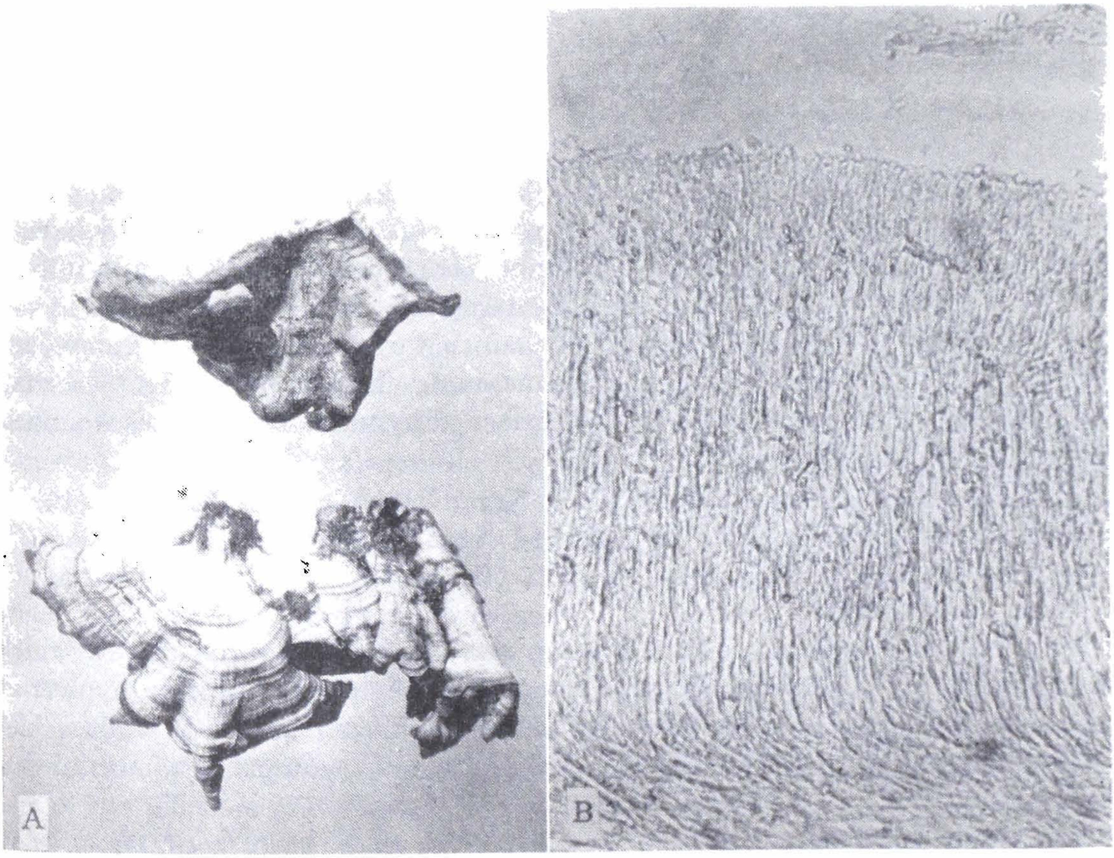

Fig. 47. *Stereum rimosum* Berk. (HF 13). A. Fruitbodies, ×2/3. B. Vertical section through the hymenium, ×ca. 100.

toward hymenium and changing into pseudocystidia; hymenium 40–70 μ thick; subcutis 20–80 μ thick, yellow to pale brownish.

Stereum princeps (Jungh.) Lév. in Ann. Sci. Nat. Bot. ser. 3, **2**: 210 (1844). *Thelephora princeps* Junghun, Fl. Crypt. Java., **1**: 39 (1838).

Darjeeling: Palmajua, 2300 m (May 4, 1960, HF4, HF8); Batasi, 2000 m (May 2, 1960, HF5, HF17); Ramam, 2400 m (May 7, 1960, HF6, HF7, HF9).

Distr. Common in the subtropical and tropical regions of Asia, and southern Japan.

Stereum rimosum Berkeley in Hook. Journ. Bot. **3**: 169 (1851)–Bresadola in Hedw. **51**: 322 (1911). [Fig. 47]

Darjeeling: Lopchu, 1500 m (Apr. 28, 1960, HF13, HF102).

Distr. Himalaya, S. E. Asia, and Japan?

The species was originally described from Darjeeling by Berkeley based on the specimen collected by J. D. Hooker. Bresadola wrote the following notes about the Philippine specimen: Sp. non inventae, strato hymenialis 150–300 μ longus; basidia 3–4 μ crassa; organa ductoris granuloso farcta, apice clavato, vix emargentia, 5–6 μ crassa, hyphae contextus 2–5 μ; pili pilei 3–5 μ crassi.

The present specimens accord with the original description in outer appearance and also agree with Bresadola's notes. In the present specimens: spores hyaline, smooth, oblong-ellipsoid, 5.5–7 × 2.5–3 μ, amyloid; basidia 3.7–5 μ thick; gland cell (vascular hyphae) long clavate, thick walled, containing yellow-brown content, 5–7.5 μ thick; hyphae in the context hyaline, septate, thin and thick walled, 3.8–5 μ thick; tomental hairs 3–7.5 μ thick, hyaline or sometimes including yellow-brown substance like vascular hyphae; subcutis distinct under superficial tomentose layer, pale yellowish under the microscope, 15–30 μ thick; hymenium 150–400 μ thick; context 700–1,000 μ thick.

As Berkeley noticed, the species is allied to *Stereum ostrea* but differs by having the finely cracked hymenium. It is a reliable characteristic to distinguish it from *S. ostera.* Microscopically, the species is characterized by the very thick hymenium which is two or three times thicker than that of *S. ostrea,* and has abundant and distinctive glandular organs in the hymenium. It is supposed that there may occur the brownish discoloration on the surface of hymenium when it is wounded in fresh condition.

Steccherinum ochraceum (Fr.) S. F. Gray, Nat. Arr. Brit. Pl. **1**: 651 (1821). *Hydnum ochraceum* Fr., Syst. Myc. **1**: 414 (1821).

Sikkim: Yoksam, 1700 m (May 17, 1960, HF36a).

Distr. World-wide.

Spores hyaline, oblong, 5–5.5 × 2.5–3 μ, non amyloid; cystidia clavate, thick walled, obliquely penetrating through hymenium, slightly projecting; hyphae in context hyaline, septate, branching, without clamp connections, thin walled, 3.7–5 μ thick; hyphae in trama slightly thinner than the context hyphae, 2.5–5 μ thick.

Merulius tremellosus Schrad. ex Fries, Syst. Myc. **1**: 327 (1821).

Darjeeling: Ramam, 2400 m (May 7, 1960, HF20).

Distr. World-wide.

Spores allantoid, 3.8–4.3 × 1.2–1.8 μ, non amyloid; cystidia clavate, encrusted, 15–30 × 5–7 μ, usually not projecting from hymenium; hyphae with clamp connections.

Bjerkandera adusta (Willd. ex Fr.) Karsten in Medd. Soc. Faun. Fl. Fenn. **5**: 38 (1879).

Polyporus adustus Willd. ex Fr., Syst. Myc. **1**: 363 (1821).

Sikkim: Bakkim, 2600 m (May 19, 1960, HF21); Gangtok, 1750 (Jun. 15, 1960, HF22).

Distr. World-wide.

Coltricia cinnamomea (Fries) Murrill in Bull. Torr. Bot. Cl. **31**: 343 (1904).

Polyporus cinnamomeus Fries, Epicr. Myc. 468 (1838).

Darjeeling: Ramam, 2400 m (May 7, 1960, HF57).

Distr. Europe, Asia (India, Himalaya, China, Japan), N. America and New Zealand.

Spores hyaline, ellipsoid, non-amyloid nor dextrinoid, 9–10 × 5–5.7 μ.

Coriolus emodensis (Berkeley) Imazeki et Aoshima, comb. nov. [Fig. 48, 49 a]

Daedalea emodensis Berkeley in Hook. Journ. Bot. **6**: 166 (1854).

Darjeeling: Takdah, 1600 m (Apr. 18, 1960, HF54); Batasi, 2150 m (May 2, 1960, HF56).

Distr. Endemic to Himalaya.

The present materials agree exactly with the original description given by Berkeley and the type specimen in the Kew Herbarium in gross appearance. In the notes written by Berkeley, he said this species is always more or less velvety, sometimes densely sometimes however nearly smooth, and is very different from every form of *Lenzites repanda*, with which it ought not to be confounded, though, like other similar fungi, it varies considerably.

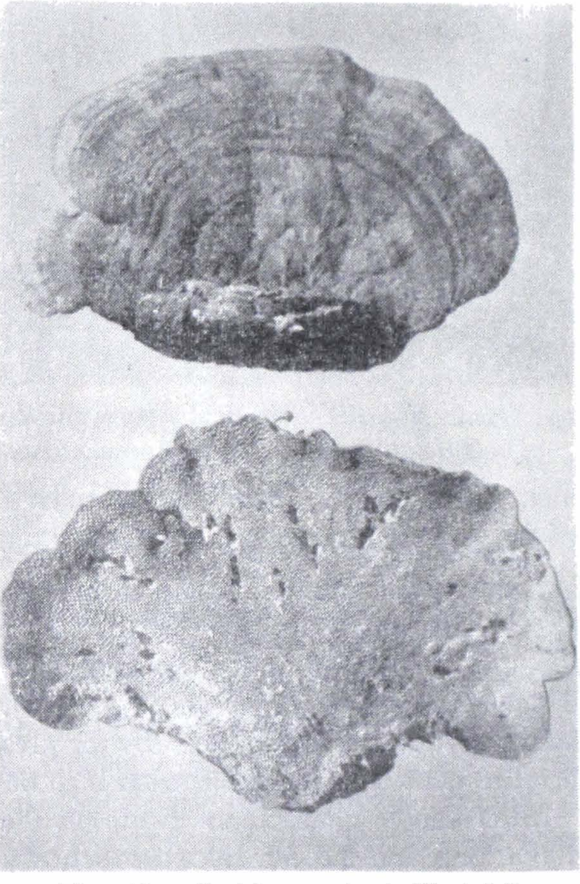

Fig. 48. *Coriolus emodensis* (Berk.) Imaz. et Aosh. (HF 56), ca. × 1.

When Imazeki visited the Kew Herbarium, he examined the type specimen of this species. The following is his note about the type: " the species seems to belong to the *Trametes gibbosa* group, the pores are exactly similar, the velutinate surface of the pileus is also exactly the same, but there exists a pale red-purplish stain on the basal part of the pileus which may be an only characteristic of the fungus distinguishing it from *T. gibbosa* with the naked eye." He did not make the microscopical examination.

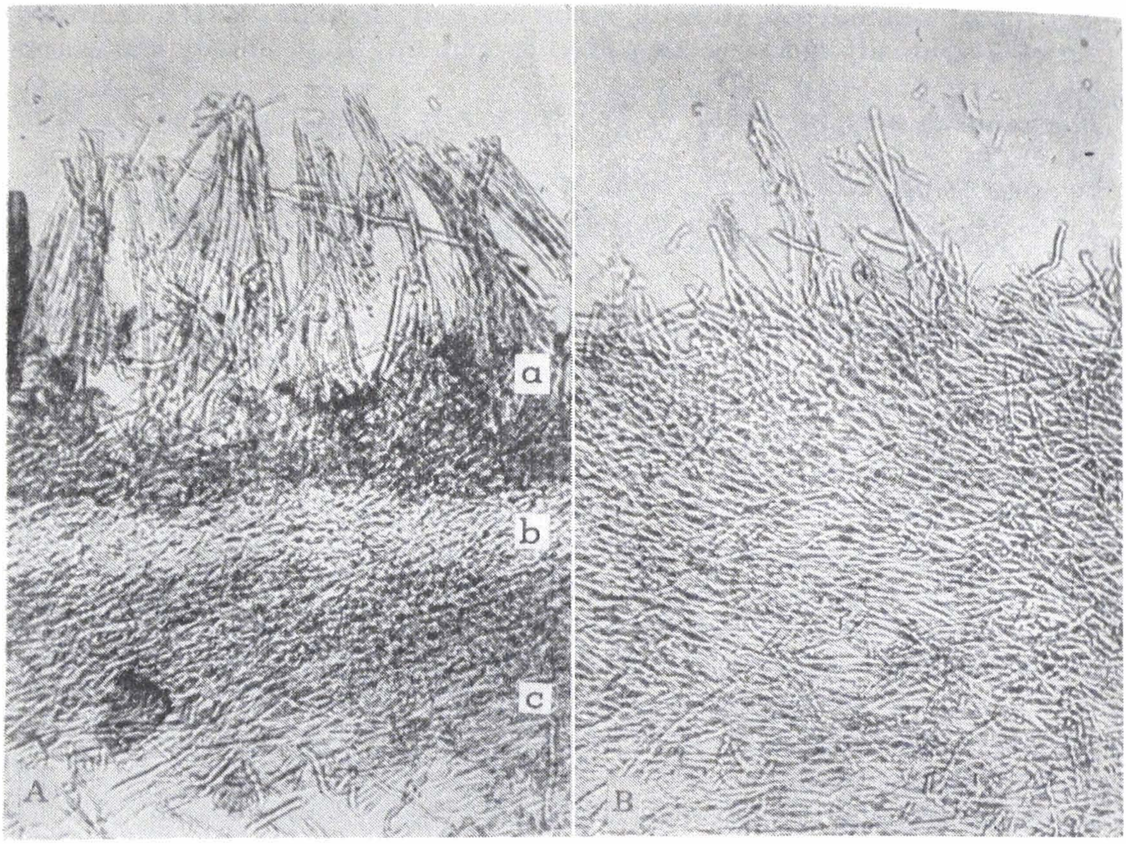

Fig. 49. Vertical section through the cortical portion of the pilei of *Coriolus emodensis* (Berk.) Imaz. et Aosh. (A), and *Trametes gibbosa* Fr. (B). a, superficial tomentose layer; b, subcutis; c, context.

After having made the comparative examination between Japanese *T. gibbosa* and the present materials, the authors came to the conclusion these two are distinct. The most distinctive characteristic of *Coriolus emodensis* is the presence of subcutis developing under the superficial tomentose hairs, while such a subcutis is never formed in *T. gibbosa* (Fig. 49 B). The subcutis is able to be seen under hand lens as a thin dark line. By the presence of distinct subcutis under the superficial tomentose layer, the fungus is to be placed in the genus *Coriolus*.

Microscopic characters: Hairs on the upper surface of the pileus erect, 30–400 μ long and 3.5–5 μ thick; subcutis yellowish under the microscope, 30–50 μ thick, consisting of agglutinated hyphae; hyphae of context dimitic, skeletal hyphae hyaline, aseptate, not branched, without clamp connections, 3–5.5 μ diam., generative hyphae hyaline, 2.5–5 μ thick, septate, branched, without clamp connections, thin walled; trama homogeneous with the context; spores not found.

Coriolus hirsutus (Wulf. ex Fr.) Quélet, Enchir. Fung. 175 (1886).

Polyporus hirsutus Wulf. ex Fries, Syst. Myc. **1**: 367 (1821).

Darjeeling: Rayang, 250 m (Apr. 18, 1960, HF24).

Distr. World-wide.

Coriolus tephroleucus (Berkeley) Bondarzew, Polyp. Eur. Rus. & Caucas. 492 (1953). [Fig. 50]

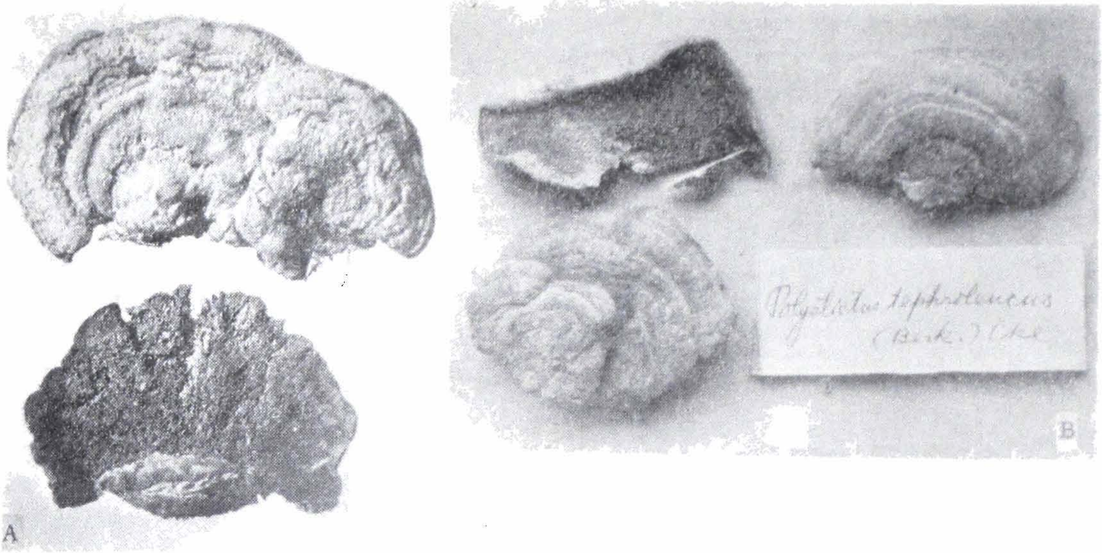

Fig. 50. *Coriolus tephroleucus* (Berk.) Bond. A. The present specimens (HF 33), ca. × 1. B. The type specimen in the Kew Herb. (*Trametes tephroleuca* Berk., *Polystictus tephroleucus* (Berk.) Cke.), ca. × 3/4.

Trametes tephroleuca Berkeley in Hook. Journ. Bot. **6**: 165 (1854).

Sikkim: Jongri–Gamothang, 3750 m (May 26, 1960, HF33). Darjeeling: Ramam, 2400 m, (May 7, 1960, HF35). E. Nepal: Ghatte, 1850 m (Nov. 17, 1963, HF 125).

Distr. Himalaya, and northern Europe.

The species was originally described by Berkeley based on the specimen collected by Hooker f. in the East Nepal. According to Berkeley's description, it resembles *Polystictus hirsutus*, but differs from the latter by having larger pores which are written as about 1/36 of an inch (ca 0.6 mm) across and different color of the pores which is cinereous.

In the present materials, the fruitbodies resemble very much *Coriolus hirsutus* except the size of pores which are measured 1–2 per mm comparing 3–4 per mm in *C. hirsutus*. As to the color of pores, it is pale cinnamon to clay colored in some collections (HF 33 & 35), which might have been more whitish when fresh, and ash-colored in other collection (HF 125). The edge of pore walls is not entire but sinuous or denticulate. In *Coriolus hirsutus* and its allies, the pores are whitish or ochraceous but frequently ashy in color, and the edge of walls is very variable from entire to toothed in the same species. Accordingly, the authors think that these natures are not worth separating species from each other. Fig. 50, B is the photograph of the type specimen of *Trametes tephroleuca* Berk. taken by Imazeki at Kew. The fungus is recorded from European U.S.S.R. (Caucasus, Kirgis and Uzbek) by Bondarzew.

Coriolus velutinus (Fr.) Quélet, Enchir. Fung. 175 (1886).

Polyporus velutinus Fries, Syst. Myc. **1**: 368 (1821).

Sikkim: Jongri–Gamothang, 3750 m (May 26, 1960, HF26).

Distr. Europe, Asia (Himalaya, China, Japan?), N. America, and New Zealand.

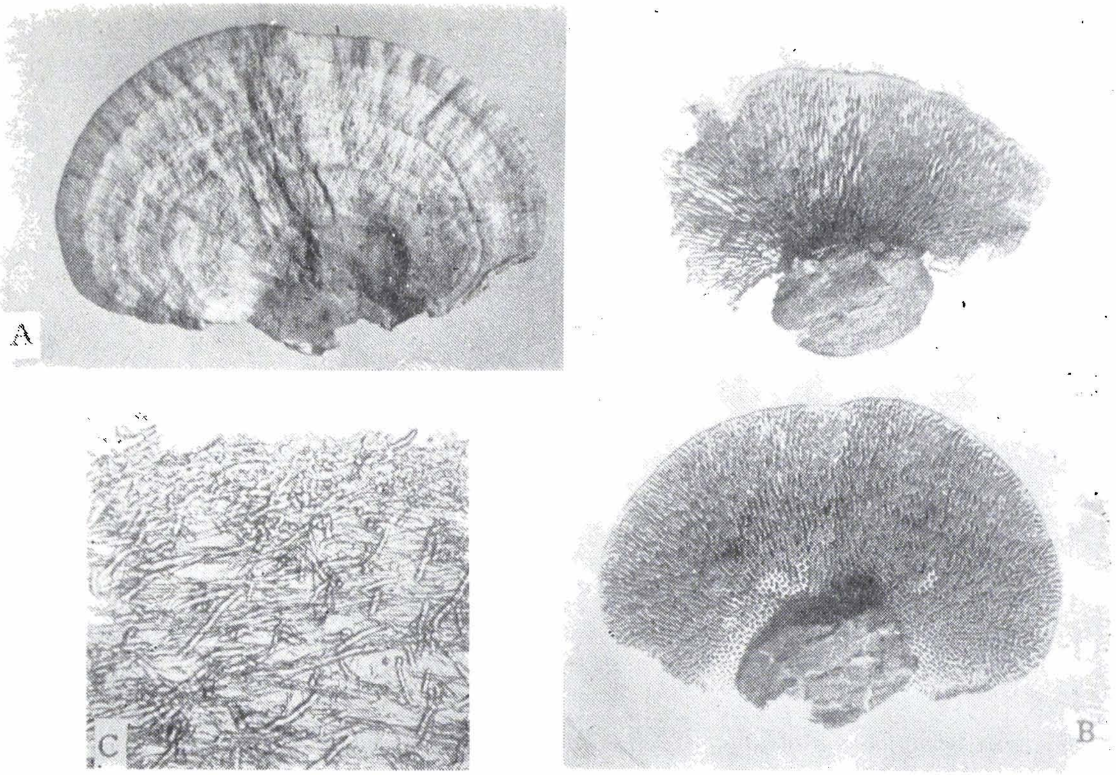

Fig. 51. *Daedaleopsis confragosa* (Bolt. ex Fr.) Schroet. (HF 37). A. Upper surface. B. Pore surface. C. Vertical section through the cortical portion of the pileus, showing its simple structure. A & B, ×4/5.

Coriolus versicolor (L. ex Fr.) Quélet, Enchir. Fung. 175 (1886).

Polyporus versicolor Fries, Syst. Myc. **1**: 368 (1821).

Darjeeling: Ramam, 2400 m (May 7, 1960, HF 27, HF 105); Takdah, 1600–1700 m (Apr. 18, 1960, HF 28, HF 104); Bakkim, 2200 m (May 19, 1960, HF 29). Sikkim: Jongri-Gamothang, 3750 m (May 26, 1960, HF 30, HF 32).

Distr. World-wide.

Daedaleopsis confragosa (Bolt. ex Fr.) Schroeter, Pilze Schles. **1**: 493 (1888).

Daedalea confragosa Bolt. ex Fries, Syst. Myc. **1**: 336 (1821). [Fig. 51]

Darjeeling: Rayang, 250 m (Apr. 18, 1960, HF 37).

Distr. Throughout the temperate zone in the Northern Hemisphere.

There is a little doubt about the author's identification. The following is the description of the present specimen: Pileus dimidiate but often attached by a disk, 6–12×4–6.5 cm large, 0.8–2 cm thick near the base; surface dirty leather colored, with narrow concentric furrows and dark and pale broad zones, radially rugulose, uneven, glabrous, margin thin, acute; context corky, wood colored, thin, about 2 mm thick, in section almost occupied by hymenophore, homogeneous with trama; hymenophore variable, porose, daedaloid or lamelloid, about 1 mm or a little more broad, 1–1.8 cm deep near the base, edge sinuate; spores not found; hyphae of both the context and trama trimitic, generative hyphae thin walled, septate, branched, with few clamp connections, 1.7–5.5 μ thick; skeletal hyphae hyaline, 4–6 μ thick, thick walled, aseptate, not branched; binding hyphae hyaline, 1.2–1.8 μ thick, richly branched, abundant; no dermal differentiation on the surface of the pileus.

Daedaleopsis purpurea (Cooke) Imazeki et Aoshima, comb. nov. [Fig. 52 & 53]

Trametes purpurea Cooke, Grev. **10**: 121 (1882)-Saccardo, Syll. Fung. **6**: 352 (1888).

Daedaleopsis nipponica Imazeki in Bull. Sci. Mus. Tokyo **6**: 78 (1943)-Imazeki et Hongo, Color, Ill. Fungi Japan, 113, Pl. 53, no. 294 (1957)-S. Ito, Mycol. Fl. Japan, II, **4**: 251 (1955).

Trametes confragosa Lloyd ex Yasuda (non Rabenhorst) in Bot. Mag. Tokyo **31**: 60 (1917), nom. nud.

Darjeeling: Takdah, 1600 m (Apr. 19, 1960, HF 38); Sikkim: Gamothang, 3800 m (May 29, 1960, HF 39).

Distr. Himalaya, and Japan.

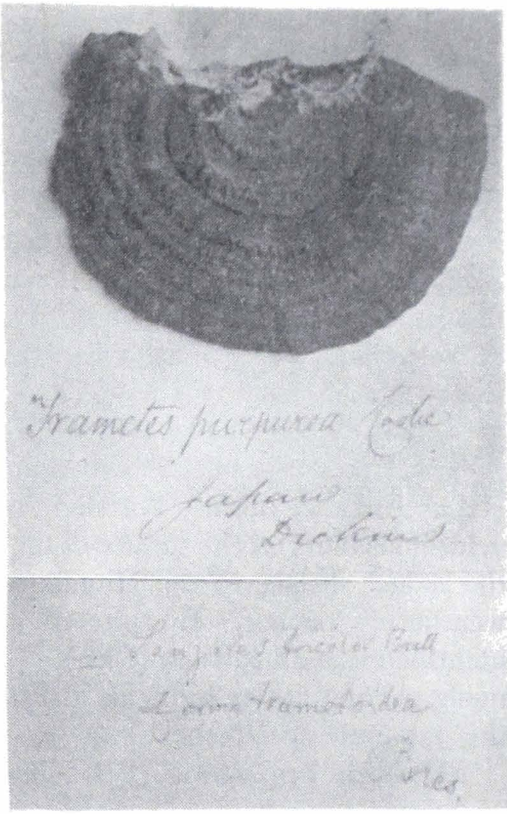

Fig. 52. *Daedaleopsis purpurea* (Cke.) Imaz. et Aosh. The type specimen in the Kew Herb., with the Bresadola's handwriting," *Lenzites tricolor* Bull. f. *trametoidea* Bres." on the sheet. × 1.

The species was originally described by M. D. Cooke based on the fungus collected by Dickins in Japan. The type specimen is preserved in good condition in the Kew Herbarium. Since the time when Cooke described it, it has past more than eighty years till now. During these years, the name *Trametes purpurea* has not been brought into discussion as a mycological topic except C. G. Loyd used once this name for a Japanese specimen (Letter, 48, p. 5) but his identification was incorrect. The fungus is not rare in Japan, and has been collected many times there. About

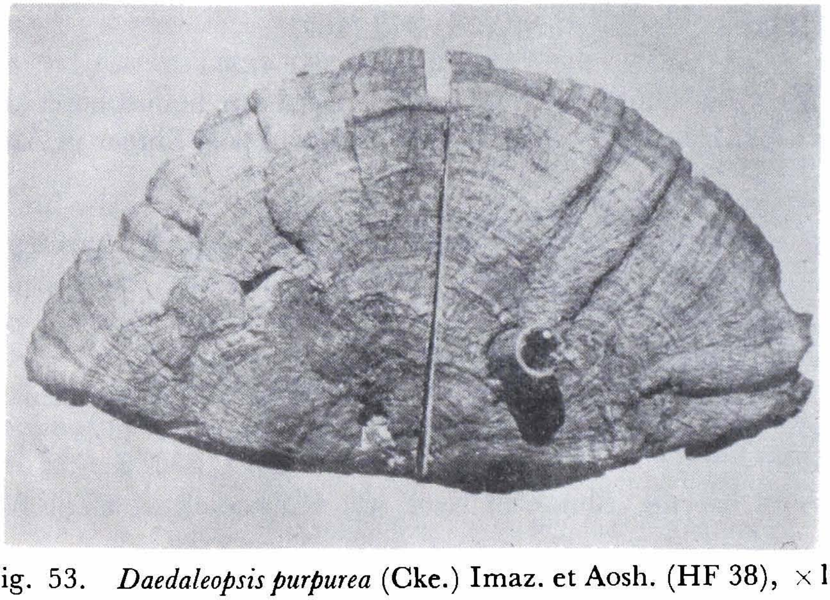

Fig. 53. *Daedaleopsis purpurea* (Cke.) Imaz. et Aosh. (HF 38), × 1.

fourty years ago, several specimens were sent to C. G. Lloyd by Japanese workers. Lloyd answered them as following: " *Trametes confragosa*, unnamed form. We don't have this form in America " (Letter, 47, p. 9, 1913). Since then, it was called *Trametes confragosa* Lloyd (non Rabenhorst) in Japan, until Imazeki gave it a new name, *Daedaleopsis nipponica* Imazeki in 1943. When Imazeki examined the type specimen of *T. purpurea* (Fig. 52), he found that it was nothing but his *Daedaleopsis nipponica*. There was written "=*Lenzites tricolor* f. *trametoidea* Bresadola " by Bresadola on the sheet of the type specimen. The authors do not know if this name was published or not. Aoshima had also the same opinion at Beltsville where he examined the Cooke's original specimen. It had been thought, however, that the species is endemic to Japan until the authors saw the present Himalayan collection.

The Himalayan specimens do not agree exactly with the Japanese *D. purpurea* (Cke.) Imaz. et Aosh. The slight difference is the absence or presence of minute velutinous hairs on the surface of the pileus. The writer can not ascertain whether the naked surface of the Himalayan specimens might have been resulted from weathering or not. In spite of existing a slight question there, the authors identified it as *D. purpurea* (Cke.). The spores were not found in the present specimens. They are cylindrical, a little curved, smooth, hyaline, 5.5–8 × 2.–2.5 μ in the Japanese specimens.

Elfvingia applanata (Pers.) Karsten, Krit. Oefv. Finl. Basidsv. 334 (1889).

Polyporus formentarius β. applanatus Pers., Myc. Eur. **2**: 80 (1825).

Darjeeling: Palmajua, 2300 m (May 4, 1960, HF 40).

Distr. World-wide.

Favolus arcularius (Batsch ex Fr.) Ames in Ann. Myc. **11**: 241 (1913).

Polyporus arcularius Fries, Syst. Myc. **1**: 342 (1821).

Darjeeling: Rayang, 250 m (Apr. 18, 1960, HF 41); Dentam, 1450 m (May 11, 1960, HF 118).

Distr. World-wide.

Fomitopsis pinicola (Sw. ex Fr.) Karst., Rev. Myc. **3** (9): 18 (1881).

Polyporus pinicola Fries, Syst. Myc. **1**: 372 (1821).

Darjeeling: Ramam, 2300 m (May 8, 1960, HF 123).

Distr. Widely distributed throughout the northern hemisphere.

Laetiporus sulphureus (Bull. ex Fr.) Bondarzew et Singer in Ann. Myc. **39**: 51 (1941).

Polyporus sulphureus Fries, Syst. Myc. **1**: 357 (1821).

Darjeeling: Sandakphu–Tonglu, 3000 m (June 7, 1960, HF 43); Sikkim: Pamianchi, 1900 m (May 14, 1960, HF 42).

Distr. World-wide.

Lenzites betulina L. ex Fries, Epicr. Myc. 405 (1838).

Darjeeling: Palmajua, 2300 m (May 4, 1960, HF 44); Sikkim: Pamianchi, 2000 m (May 13, 1960, HF 45); Bakkim, 2200 m (May 19, 1960, HF 46).

Distr. World-wide.

Microporus luteus (Blume et Nees) O. Kuntze, Rev. Gen. Pl. **3** (2): 496 (1898).

Polyporus luteus Bl. et Nees, Fung. Jav. 16 (1826).

Darjeeling: Rayang, 250 m (Apr. 18, 1960, HF 49).

Distr. Subtropical and tropical Asia.

Microporus xanthopus (Fries) Patouillard, Ess. Tax. 83 (1900).

Polyporus xanthopus Fries, Syst. Myc. **1**: 350 (1821).

Darjeeling: Rayang, 250 m (Apr. 18, 1960, HF 50); Tista, 300 m (Apr. 26, 1960, HF 51, HF 52).

Distr. Common in the subtropical and tropical Asia, and Africa.

Hymenochaete attenuata Léveillé in Ann. Sci. Nat. ser. 3, **5**: 152 (1846)–Cunningham in Trans. Roy. Soc. N. Z. **85**: 33 (1957). [Fig. 54]

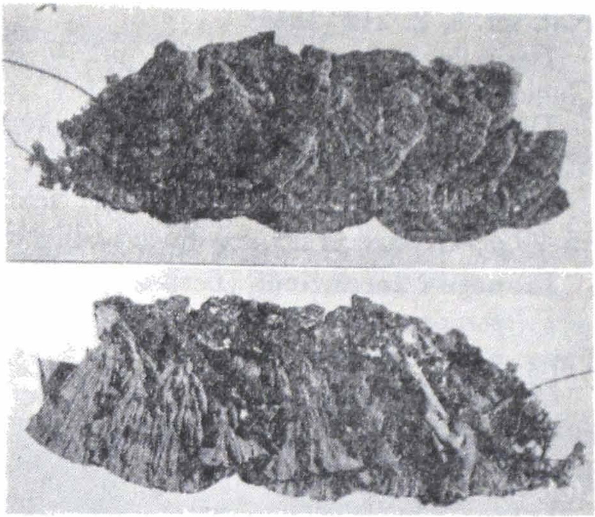

Fig. 54. *Hymenochaete attenuata* Lév. (HF 84), × 1.

Sikkim: Gangtok, 1750 m (Jun. 14, 1960, HF 84).

Distr. S. E. Asia, Australia and New Zealand.

Spores ellipsoid, hyaline, 5.5–6 × 2.5–3 μ; setae 65–90 × 8–10 μ, projecting up to 30μ; hyphae thick walled, sometimes branching 3–4 μ thick.

Hymenochaete Mougeotii (Fr.) Cooke, Grev. **8**: 147 (1880).

Thelephora Mougeotii Fries, Elench. Fung. **1**: 188 (1828).

Sikkim: Gamothang, 3750 m (May 27, 1960, HF 86, HF 109, HF 110); Jongri, (May 20, 1960, HF 108).

Distr. World-wide.

Spores elliptical, hyaline, 8–8.5 × 3.5–4.3 μ; setae 65–85 × 6–11 μ; dendrophyses hyaline, 2–3.8 μ thick.

Hymenochaete rubiginosa (Dicks. ex Fr.) Léveillé in Ann. Sci. Nat. ser. 3, **5**: 151 (1846).

Thelephora rubiginosa Dicks. ex Fries, Syst. Myc. **1**: 436 (1821).

Darjeeling: Ramam, 2300 m (May, 1960, HF 87).

Distr. World-wide.

Hymenochaete Sallei Berkeley et Curtis in Journ. Linn. Soc. **10**: 333 (1869).

Darjeeling: Palmajua, 2300 m (May 4, 1960, HF 88).

Distr. C. & S. America, and Asia.

Hymenochaete villosa (Lév.) Bresadola in Ann. Myc. **8**: 588 (1910)–Aoshima & Furukawa in Trans. Jap. Myc. Soc. **7**: 13 (1966). [Fig. 55]

Stereum villosum Léveillé in Ann. Sci.

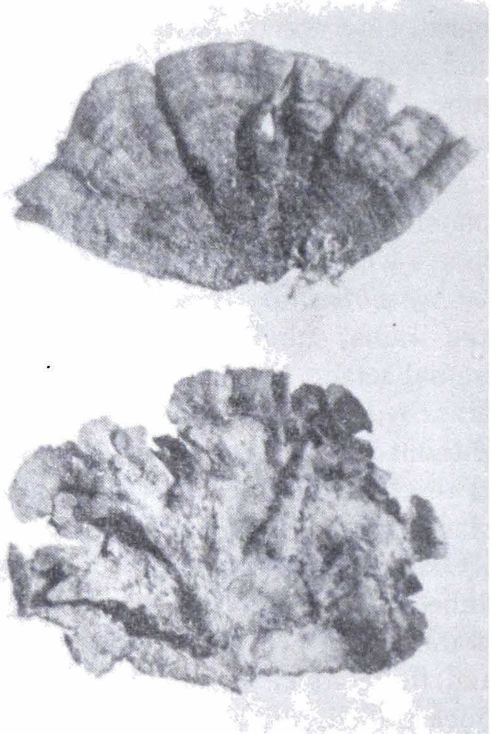

Fig. 55. *Hymenochaete villosa* (Lév.) Bres. (HF 89), × 1.

Nat. ser. 3, **2**: 212 (1844).

Darjeeling: Senchal, 2400 m (Apr. 16, 1960, HF 111); Sikkim: Gangtok, 1750 m (June 14, 1960, HF 89).

Distr. India (Himalaya), Ceylon, Java, Malaya, Formosa, Japan (Kyushu, Yaku I.), Australia, New Zealand, and Tasmania.

Spores ellipsoid, hyaline, 5.5 × 3 μ; setae lanceolate, 37 × 7 μ, projecting up to 15–20 μ; hyphae in context thick walled, 3.5–4 μ thick.

Inonotus xeranticus (Berkeley) Imazeki et Aoshima, comb. nov. [Pl. 27]

Polyporus xeranticus Berkeley in Hook. Journ. Bot. **6**: 161 (1854)–Saccardo, Syll. Fung. **6**: 279 (1888).

Cryptoderma citrinum Imazeki in Bull. Sci. Mus. Tokyo **6**: 107 (1943)–Imazeki et Hongo, Color. Ill. Fung. Japan, 143, Pl. 67, No. 394 (1957)–S. Ito, Mycol. Fl. Japan, II, **4**: 360 (1955).

Darjeeling: Palmajua, 2300 m (May 4, 1960, HF 58 & 59); Rimbick, 2200 m (May 6, 1960, HF 61); Ramam, 2400 m (May 7, 1960, HF 62).

Distr. Himalaya, Formosa, and Japan.

When the authors examined the present Himalayan collections, they were strongly impressed by abundant specimens of Japanese *Cryptoderma citrinum* Imaz. found there, because they had believed the fungus being distributed only in Japan and Formosa. In Formosa, the fungus occurs only in high altitudes.

In 1961, Imazeki and Aoshima visited Kew and Beltsville respectively, they found the fungus was already collected by Hooker f. in Himalaya and Berkeley described it under the name, *Polyporus xeranticus* Berk.

The fungus is placed in the genus *Inonotus* at present, but quite different from most of the species of the genus. It is markedly characterized by having a thin and bright yellow context which is decisively in contrast with the brown colored superficial tomentose covering and hymenophore, as if yellow context is sandwichtched in between dark colored two outer layers.

Microscopic observations: Spores oblong, straight or a little curved, hyaline, smooth, non-amyloid, 2.5–3.7 × 1.2–1.7 μ (it was the author's mistake that the spores were described as " subglobosis, 4–5 μ " in the original diagnosis of *Cryptoderma citrinum* by Imazeki); setae abundant in hymenophore both in hymenium and trama, subulate, 25–30 × 5–6.5 μ in hymenial setae and up to 150 μ long in tramal setae; hyphae of context arranged parallelly, thin walled, septate, fewly branched, pale colored or yellowish, scarcely darkened with KOH, 1.7–3 μ thick, without clamp connections; hyphae becoming brown and branching irregularly at the bottom of the context where the differentiation of the hymenophore takes place, hyphae of hymenophore pale brown or brown, changing reddish brown with KOH, thin or thick walled, branching, 1.7–3 μ thick, forming abundant setae imbedded; hyphae of trama of dissepiments almost longitudinally arranged, fewly branched, brown, 2–3 μ thick; subcrust between the superficial tomentose layer and the context up to 30 μ thick, consisting of hyphae which are dark brown, thick walled, almost horizontally and compactly arranged; superficial tomentose layer becoming more than 100 μ thick, the hairs brown, thick walled, septate, branched, blackish brown with KOH, 1.7–3.8 μ thick.

Phellinus gilvus (Schw.) Patouillard, Ess. Tax. 97 (1900).

Boletus gilvus Schweinitz, Schr. Nat. Ges. Leipzig **1**: 96 (1822).

Polyporus gilvus Fries, Elench. Fung. 104 (1828).

Darjeeling: Senchal, 2400 m (Apr. 16, 1960, HF 66 & 67); Takdah, 1600 m (Apr. 18, 1960, HF 68 & 69); Lopchu, 1500 m (Apr. 28, 1960, HF 70).

Distr. World-wide.

Phellinus igniarius (L. ex Fr.) Quélet, Enchir. Fung. 172 (1886).

Polyporus igniarius Fries, Syst. Myc. **1**: 375 (1821).

Sikkim: Gamothang, 3800 m (May 29, 1960, HF 71).

Distr. World-wide, except the tropical region.

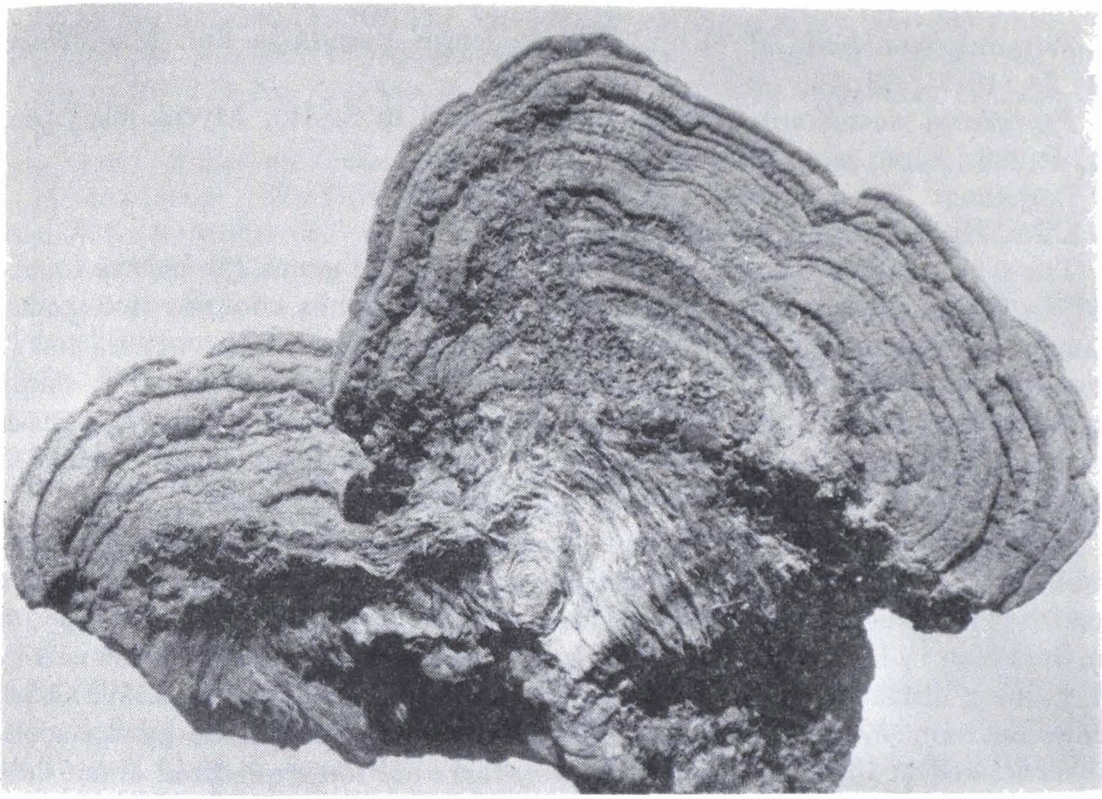

Fig. 56. *Phellinus Laurencii* (Berk.) Aosh., × 1/2.

Phellinus Laurencii (Berk.) Aoshima in Trans. Jap. Mycol. Soc. **7**: 51 (1966). [Fig. 56]

Polyporus Laurencii Berk., Flora Tasmaniae 254 (1860).

Polyporus zealandicus Cooke in Grevillea **8**:55 (1879).

Fomes zealandicus (Cke.) Cke. in Grevillea **14**: 18 (1885)–Cunningham in Trans. New Zeal., Inst. **58**: 213 (1927).

Fomes senex (Nees et Mont.) Cke. var. *hamatus* Corner in Trans. Brit. Mycol. Soc. **17**: 75 (1932).

Phellinus hamatus (Corner) Imazeki in Bull. Sci. Mus. Tokyo **6**: 104 (1943).

Darjeeling: Batasi, 2150 m (May 2, 1960, HF 72; May 6, 1960, HF 75); Palmajua, 2300 m (May 2, 1960, HF 73 & 74); Ramam, 2400 m (May 7, 1960, HF 76 & 77; Sikkim: Pamianchi, 1900 m (May 14, 1960, HF 78).

Distr. Africa, S. & E. Asia (Himalaya, Formosa, Japan, Java), Australia, New Zealand, N. & C. America, etc.

The fungus seems to be very common in the Himalayan region. It has been misreferred very frequently to *Fomes senex* (Nees et Mont.), and Berkeley's record *Polyporus senex* Nees et Mont. from this region might be based on the species considered here.

Pyrrhoderma adamantinum (Berkeley) Imazeki in Trans. Mycol. Soc. Japan **7**: 3 (1966). [Pl. 28]

Polyporus adamantinus Berkeley in Hook. Journ. Bot. **6**: 141 (1854).

Fomes adamantinus (Berk.) Cooke in Grev. **14**: 21 (1885)–Lloyd, Synop. Fomes 235 (1915).

Polyporus musashiensis (P. Henn.) Yasuda sensus Yasuda in Bot. Mag. Tokyo **31**: 54 (1917); **38**: 146 (1924).

Pyrrhoderma musashiensis Imazeki sensu Imazeki in S. Ito, Mycol. Fl. Japan, II, **4**: 289 (1955), nom. nud.

Darjeeling: Batasi, 2150 m (May 2, 1960, HF 83).

Distr. Himalaya and Japan.

The senior author Imazeki published recently "The genus *Pyrrhoderma* Imazeki" in Trans. Mycol. Soc. Japan, **7**: No. 1. The genus contains two species, namely *P. sendaiense* (Yasuda) Imazeki, the type species of the genus, and *P. adamantinum* (Berk.) Imaz. It belongs to the Hymenochaetales and is chiefly characterized by having the well differentiated crust which is of palisadodermous texture like in the Ganodermoideae. The type species is known as endemic to Japan and the other species is known from Himalaya and Japan.

In Japan, the present fungus had been called *Polyporus musashiensis* P. Henn. sensu Yasuda and Imazeki non sensu Lloyd. In literatures, there are two more records of this fungus from outside of Himalaya and Japan. The one was reported by Bresadola in Hedw. **53**: 58 (1912) from the Philippines and the other was by H. Lohwag in Handel-Mazetti, Symb. Sin. Fungi 50 (1937) from S. W. China, under the name *Fomes musashiensis* P. Henn. which was determined by Bresadola. As mentioned in Imazeki's paper, however, there are some questions about these two records. Accordingly, it is concluded at present that the fungus is definitely known only from the Himalayan region and Japan.

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Distr. Himalaya, East Asia, and Java.

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Distr. World-wide.

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Distr. World-wide.

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TAXONOMIC COMPARISON BETWEEN CORRESPONDING TAXA OF SPERMATOPHYTA IN EASTERN HIMALAYA AND JAPAN

by

Hiroshi HARA

In 1855, Hooker fil. and Thomson have already clearly stated in their Flora Indica **1**: 181 that the flora of Sikkim bears a remarkable resemblance to that of Japan. Although Eastern Himalaya and Japan are now widely separated, the floras of both regions are considered to have been derived from the common flora of the Tertiary which had covered whole East Asia including Himalaya, China, and Japan. By the great geographic and climatic changes occurred since the late Tertiary especially during the Quaternary glaciation, their floras have developed into different ones in each region, influenced by their diverse environmental conditions. Japan and Eastern Himalaya have been affected in general by similar changes in the past, and various ancient elements have survived there, although they have differentiated into somewhat different races. Thus, to compare critically various corresponding taxa which are now found in Eastern Himalaya and Japan gives important data on the origin of the Japanese flora and the evolution of the plant groups involved in the flora.

The present paper is prepared mainly based on the material collected in West Sikkim, East Nepal, and the Darjeeling and Kalimpong districts during the Botanical Expeditions to Eastern Himalaya organized by University of Tokyo in 1960 and 1963.

Eastern Himalaya is situated nearly at the same latitude as the Okinawa islands in the Japanese Archipelago. Its climate somewhat resembles that of Japan, but rainy and dry seasons are much more distinct in Himalaya, and a rain-fall is very little from November to April, although the atmospheric humidity is high. The temperature in winter is comparatively high, and even at Darjeeling (alt. 2100 m) the mean temperature of the coldest month is 4.4°C, and snow rarely falls, and on the other hand, the mean temperature of the warmest month is only 16.1°C there. In Japan, the winter is very severe often with heavy frost and snow, and the summer is hot and sultry.

The altitudinal changes of floral zones are also considerably different from each other. In Eastern Himalaya, the valleys below about 1000 m high belong to the tropical floral zone which is lacking in Japan.

The warm temperate (or partly subtropical) zone between 1000 m and 2800 m high in East Himalaya is predominated by evergreen broad-leaved forests with many epiphytes, and is mixed with deciduous trees. It is very similar to the corresponding warm-temperate zone in the warmer part of Japan, and includes a large number of Japono-Himalayan elements.

In mountain districts between 2800–3100 m high, evergreen *Rhododendron* predominate, often mixed with *Tsuga dumosa.* The coniferous forest of *Abies spectabilis* comparable to that of Japan found at 1500–2300 m in central Honshu, occurs between 3100–3800 m high, associated with the *Rhododendron* species. It is striking that the deciduous forest which is characteristic in the temperate zone of Japan is absent in Eastern Himalaya. The *Rhododendron* forest prevails up to the timber line which lies at about 4000 m high. In the alpine zone occur only a few alpine plants which are closely related to those of Japan.

Various Japanese plants have been planted at Darjeeling and its neighbouring districts. *Cryptomeria japonica* D. Don is extensively grown in the temperate zone between 1500 and 2500 m high. Other horticultural plants of the Japanese origin found there are *Hydrangea macrophylla* Seringe, *Camellia japonica* L. with many cultivars, *Aucuba japonica* Thunb., *Rhododendron mucronatum* G. Don, *Deutzia crenata* Sieb. et Zucc. f. *plena* Maxim., *Kerria japonica* DC. f. *plena* Schneid., *Acer palmatum* Thunb., *Euonymus japonica* Thunb., *Nandina domestica* Thunb., *Spiraea Thunbergii* Sieb., *Shibataea Kumasaca* Makino, etc. Also some ornamental plants probably of the Chinese origin are planted or naturalized both in Himalaya and Japan. They are *Anemone hupehensis* Lemoine var. *japonica* (Thunb.) Bowles et Stearn, *Belamcanda chinensis* (L.) DC., *Lycoris radiata* (L'Hérit.) Herb., *Hemerocallis fulva* L. var. *Kwanso* Regel, and *Salix babylonica* L.

Many weedy species are common to Eastern Himalaya and Japan. Such examples are *Persicaria perfoliata* (L.) Gross, *Amaranthus lividus* L., *Chenopodium album* L., *Mollugo pentaphylla* L., *Portulaca oleracea* L., *Cerastium glomeratum* Thuill., *C. holosteoides* Fries var. *hallaisanense* (Nakai) Mizushima, *Drymaria diandra* Blume, *Sagina japonica* (Sw.) Ohwi, *Stellaria Alsine* Grimm, *S. aquatica* (L.) Scopoli, *S. media* (L.) Villars, *Capsella Bursa-pastoris* (L.) Medik, *Cardamine impatiens* L., *C. scutata* Thunb. subsp. *flexuosa* (With.) Hara, *Rorippa dubia* (Pers.) Hara, *Vicia hirsuta* S. F. Gray, *Oxalis corniculata* L., *Chamaesyce hirta* (L.) Millsp., *C. supina* (Rafin.) Moldenke, *Phyllanthus Niruri* L., *P. Urinaria* L., *Sarothra laxa* (Bl.) Y. Kimura, *Ammannia baccifera* L., *A. multiflora* Roxb., *Rotala indica* (Willd.) Koehne, *R. leptopetala* (Bl.) Koehne, *R. rotundifolia* (Roxb.) Koehne, *Ludwigia octovalvis* (Jacq.) Raven, *Hydrocotyle sibthorpioides* Lam., *Torilis japonica* (Houtt.) DC., *Dopatrium junceum* (Roxb.) Ham., *Limnophila aromatica* (Lam.) Merr., *L. indica* (L.) Druce, *L. sessiliflora* (Vahl) Bl., *Lindernia procumbens* (Kr.) Philc., *Mazus japonica* (Thunb.) O. Kuntze, *Microcarpaea minima* (Koenig) Merr., *Vandellia Anagallis* (Burm.) Yamaz., *V. angustifolia* Benth., *V. crustacea* (L.) Benth., *Veronica javanica* Bl., *Gynostemma pentaphyllum* (Thunb.) Makino, *Lobelia chinensis* Lour., *Adenostemma Lavenia* (L.) O. Kuntze, *Carpesium abrotanoides* L., *Centipeda minima* (L.) A. Br. et Aschers., *Conyza japonica* Less., *Eclipta prostrata* L., *Emilia sonchifolia* (L.) DC., *Gnaphalium affine* D. Don, *G. hypoleucum* DC., *Siegesbeckia orientalis* L., *Sonchus arvensis* L., *Youngia japonica* (L.) DC., *Blyxa Aubertii* Richard, *Lemna perpusilla* Hegelm., *Wolffia arrhiza* (L.) Horkel, *Commelina benghalensis* L., *Murdannia nudiflora* (L.) Brenan, *Monochoria vaginalis* (Burm.) Presl, *Juncus Leschenaultii* Gay, *J. monticola* Steud., *J. Wallichianus* Laharpe, and others belonging to Gramineae and Cyperaceae. It is difficult to confirm whether they are all introduced to the district in recent years or some of them have been growing there since the prehistoric time.

On the other hand, we have transplanted many Eastern Himalayan plants to Japan. On account of climatic differences above mentioned, however, it is often difficult to cultivate them in Japan. The way of response to the climate of Japan is different in the plant group concerned. So far as our short experiences are concerned, they show quite different ranges of tolerance as follows.

In Tokyo, young plants of *Prunus cerasoides*, *Leycesteria stipulata*, and many subtropical elements are not hardy out of doors, but they grow well in the southern part of Japan. *Spiraea micrantha*, *Norysca Urala*, *Agrimonia*, *Picris*, *Artemisia*, etc. grow in Tokyo neary in a similar manner to their corresponding taxa of Japan. Whereas *Fragaria*, *Chrysosplenium*, and *Meconopsis* do not persist through hot summer in Tokyo.

We have planted some Himalayan plants at Karuizawa (alt. 1000 m) in Central Honshu. The temperature there in summer is low and is similar to that of Darjeeling, but the winter is much more severe, the lowest temperature falling down to −18°C. The Himalayan species of *Fragaria*, *Chrysosplenium*, *Tiarella*, *Oxalis*, and *Peracarpa* grow at Karuizawa out of doors. The species with thick rhizomes or bulbs such as *Cardiocrinum giganteum*, *Smilacina fusca* can also pass the winter there. While many others are not hardy there, and *Tsuga*, *Docynia*, *Lyonia ovalifolia*, and *Euonymus vagans* have died. Only the underground parts of *Hydrangea robusta*, *H. anomala*, *Helwingia*, *Boenninghausenia* have survived, but they are becoming weaker. While such corresponding Japanese species as *Hydrangea involucrata*, *H. petiolaris*, *Helwingia japonica*, and *Lyonia ovalifolia* subsp. *Neziki* are common around Karuizawa. If protected inside a house, however, all these Himalayan plants thrive much better in Karuizawa than those grown in Tokyo.

In general, the Himalayan plants are adapted to a more mild climate both in winter and summer than that of Japan. *Lyonia ovalifolia*, *Euonymus Hamiltonianus*, *Helwingia himalaica*, *Viburnum erubescens*, *Edgeworthia Gardneri* of Himalaya sometimes do not shed their leaves in winter, and also at Karuizawa of central Japan, when protected in a glass house even without heating, their leaves persist throughout the winter. Whereas their corresponding taxa of Japan are all strictly deciduous. In Himalayan *Boenninghausenia* and *Rubia*, the stems pass the winter and branch out, but in the corresponding Japanese plants the stems above the ground totally die to the base in winter. *Peracarpa carnosa* and *Ellisiophyllum pinnatum* of Himalaya continue to grow almost all the year round, spreading long creeping stolons or stems under fallen leaves, but the corresponding Japanese plants hibernate by thickened subterranean stolons (Pl. 29).

It is also to be noted that the flowering season of Himalayan plants is sometimes different from that of the corresponding Japanese plants. *Prunus cerasoides* D. Don is in full bloom in late autumn, its autumnal leaves persist through the winter, and its fruits mature in the next spring, but all flowering cherries of Japan are deciduous and flower in spring. *Alnus*, *Corylus*, and *Daphne* also begin to bloom in late autumn in Himalaya, while their allied Japanese species always flower in early spring.

It is interesting to note that Himalayan plants are often easily propagated by cutting of young shoots. A remarkable example is observed in *Prunus cerasoides*, while the Japanese cherries are not multiplied by cutting. Some rhizomes of *Panax pseudo-Ginseng* and *Smilacina fusca* brought back Japan from Himalaya have remained in a dormant condition for two years, and then sprouted.

The differences in climatic conditions between Himalaya and Japan have had various complicated effects upon the way of differentiations in the plants of both regions. It is interesting that various Himalayan plants have more acutely pointed leaves as compared with the corresponding Japanese ones.

In the following chapters, the corresponding taxa found in Himalaya and Japan are enumerated. These examples have been greatly increased in number in recent years, and some interesting ones were added and analized based on the material of our Expeditions. The new discovery of *Tetracentron sinense* Oliver and *Hydrobryum Griffithii* Tulasne in Eastern Himalaya by our party is significant as evidence for a connecting link between Himalaya and Japan in an old age.

GYMNOSPERMAE

Podocarpus neriifolius D. Don distributed widely in the southern parts of Asia is related to *P. macrophyllus* (Thunb.) D. Don of Japan, and *Taxus baccata* L. subsp. *Wallichiana* (Zucc.) Pilger of south-east Asia is allied to *T. cuspidata* Sieb. et Zucc. of Japan and Korea.

Abies spectabilis (D. Don) Spach of temperate Himalaya corresponds to *A. Mariesii* Masters of subalpine Japan, and *Tsuga dumosa* (D. Don) Eichler to *T. diversifolia* (Maxim.) Masters. *Juniperus communis* L. var. *saxatilis* Pallas (var. *montana* Aiton) is wide-spread in the alpine and arctic regions of Northern Hemisphere including Himalaya and northern Japan, and two other geographical varieties also occur in the alpine region of northern and middle Japan.

ANGIOSPERMAE—DICOTYLEDONEAE

Houttuynia cordata Thunb. of Himalaya agrees with that of Japan both in outer morphological characters and the chromosome number. *Myrica esculenta* Hamilt. of warm-temperate south-east Asia closely resembles *M. rubra* Sieb. et Zucc. of Japan and China.

Betula utilis D. Don of temperate Himalaya is comparable in habit to *B. Ermani* Cham. of Japan and north-east Asia. It is noteworthy that *Alnus nepalensis* D. Don and *Corylus ferox* Wall. bloom in late autumn in the Himalayan region, but the corresponding taxa of Japan flower always in early spring.

The Himalayan plants which are referred to *Quercus acutissima* Carruth., and *Q. glauca* Thunb. are not exactly the same as those species originally described from Japan, and the critical comparison between them is much needed.

Trema orientalis (L.) Blume is found in tropical and subtropical regions from Africa, India, Australia east to the southern part of Japan. The genus *Ficus* is highly differentiated in India, but is rather few in Japan. And it is to be noted that polymorphic *Ficus sarmentosa* Hamilt. is represented in Japan by a geographical race, subsp. *nipponica* (Franch. et Sav.) Ohashi (see page 54).

Gonostegia hirta (Bl.) Miq. and *Pouzolzia zeylanica* (L.) J. Benn. are widely distributed in south-east Asia, and the Himalayan *Villebrunea* has been considered to be conspecific with *V. frutescens* (Thunb.) Blume of Japan. *Debregeasia longifolia* (Burm. f.) Wedd. is closely related to *D. edulis* (Sieb. et Zucc.) Wedd. of Japan and China.

The occurrence of *Asarum himalaicum* Hook. f. et Thoms. and *A. cordifolium* Fischer in Eastern Himalaya also suggests an old connecting link between Himalaya and Japan through China.

The genus **Polygonum** in a wide sense.

Many attempts have hitherto been made to divide the collective and heterogeneous genus *Polygonum* (sensu lato) into smaller natural genera based on morphological, palynological and cytological characters. The classifications proposed by Small (1903), Gross (1913) and Nakai (1926) have been very instructive, and Hedberg (1946) has also studied in detail the pollen-structure of the group. Although the opinions are still diverse by botanist, I would like to recognize the following genera in the treatment of Himalayan materials: *Fagopyrum*, *Koenigia*, *Polygonum*, *Bistorta*, *Aconogonum*, *Bilderdykia*, *Antenoron*, and *Persicaria.*

As regards *Koenigia,* I agree with Hedberg (1946) and Löve & Sparkar (1957) to include such species of sect. Eleutherosperma Hook. f. (1886) as *Pol. delicatulum* (Pl. 30 a)[1], *Pol. filicaule*, etc. in the genus.

Aconogonum Reichenb. (1837) is adopted in this paper in the same sense as *Pleuropteropyrum* Gross (1913) circumscribed by Nakai (1926), and the following new combinations become necessary[2]. It was also proved by courtesy of Dr. Masa Ikuse that the pollen grains of *Pol. polystachyum* Wall. ex Meisn. are 6-colpate

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1) Plate 30. a, a′. *Koenigia delicatula*. Kala Pokhari–Sandakphu, 3500 m (Sep. 16, 1964). 7–8-colpate, sp. 1×2 μ, size 21–23×24–26 μ. b, b′. *Aconogonum molle* var. *frondosum*. Lagyap, 2200 m (Sep. 13, 1964). 3-colporate, sp.< 1 μ, 21–23×22–26 μ. c, c′. *Aconogonum campanulatum*. Gatribas–Tonglu, 2900 m (Sep. 17, 1964). 6-rugate, sp. ca. 1 μ, 28–31×28–31 μ. d, d′. *A. campanulatum* var. *fulvidum*. Below Tonglu, 2900 m (Sep. 16, 1964). 6–12-rugate, sp. 0.5 μ, 33–36×33–36 μ. e. *Persicaria microcephala*. Gangtok, 1650 m (Sep. 13, 1964). 3-colporate, re. 3–8 μ, 27–28×29–30 μ. f. *Persicaria polystachya*. Kala Pokhari–Sandakphu, 3400 m (Sep. 16, 1964). 6-colpate, re. 2–5 μ, 24–26×28–30 μ. g. *Persicaria nepalensis*. Mai Pokhari, 1600 m (Dec. 4, 1963). 3-colporate, re. 3–10 μ, 40–42×44–46 μ. (Data given by Dr. M. Ikuse).

2) **Aconogonum** (Meisn.) Reichenbach, Handb. Nat. Pflanzensyst. 236 (1837).

Polygonum sect. *Aconogonum* Meisn., Prodr. Polygon. 43 & 55 (1826), p.p.; in Wall., Pl. Asia. Rar. **3**: 61 (1832), p.p.

Gononcus Rafin., Fl. Tellur. **3**: 17 (1838).

Pleuropteropyrum Gross in Bull. Géogr. Bot. **23**: 7 (1913)–Nakai in Rigakkai **24** (4): 296 (1926).

Aconogonum ajanense (Reg. et Til.) Hara, comb. nov.

Polygonum polymorphum var. *ajanense* Regel et Tiling, Fl. Ajan. 116 (1858).

Pleuropteropyrum ajanense (Reg. et Til.) Nakai, Rep. Veg. Daisetsu Mts. 46 & 63 (1930).

Aconogonum angustifolium (Pallas) Hara, comb. nov.

Polygonum angustifolium Pallas, Reise **3**: 230 (1776).

Aconogonum Chaneyi (B. Fedtsch.) Hara, comb. nov.

Polygonum Chaneyi B. Fedtsch. ex Steward in Contr. Gray Herb. **88**: 110, t. 4 A (1930).

Aconogonum divaricatum (L). Nakai ex Mori, Enum. Pl. Corea. 129 (1922), sphalmate *Aconopogon.*

Polygonum divaricatum L., Sp. Pl. ed. 1, 363 (1753).

Aconogonum Hookeri (Meisn.) Hara, comb. nov.

Polygonum Hookeri Meisn. in Ann. Sci. Nat. ser. 5, **6**: 352 (1866).

(Continued to the next page)

with coarse reticulation on the surface (Pl. 30 f), and resemble those of *Pol. pinetorum* Hemsl. In my opinion, it is better to refer both species to Sect. Cephalophilon of the genus *Persicaria.* Whereas *Pol. campanulatum* Hook. f. can be retained in *Aconogonum,* although the species is very characteristic in having campanulate perianths, fleshy fruiting perianths, and 6–12-rugate pollen grains very minutely spinulose on the surface (Pl. 30 c, d).

The genus *Antenoron* Rafin. (1817) (*Sunania* Rafin. 1837) was fully discussed in my previous papers in Journ. Jap. Bot. **37**: 326–332 (1962), **40**: 97–98 (1965) and **40**: 192 (1965). It is noteworthy that the specimens from Kashmir and Simla agree well with *A. neofiliforme* (Nakai) Hara, while those from Sikkim, Bhutan, N. Assam, Naga Hills, and Manipur belong to *A. filiforme* var. *kachinum* (Nieuw.) Hara.

The genus *Persicaria* here defined includes those sections such as Echinocaulon, Amblygonon, Chylocalyx, Cephalophilon, and Corymbocephalon (Ampelygonum).

Aconogonum jeholense (Kitagawa) Hara, comb. nov.
Pleuropteropyrum jeholense Kitagawa in Rep. First Sci. Exped. Manch. sect. 4, **4**: 77 (1936).
Aconogonum limosum (Komar.) Hara, comb. nov.
Polygonum limosum Komarov in Bull. Jard. Bot. Petersb. **16**: 165 (1916).
Aconogonum microcarpum (Kitag.) Hara, comb. nov.
Pleuropteropyrum microcarpum Kitagawa in Bot. Mag. Tokyo **50**: 73 (1936).
Aconogonum mollifolium (Kitag.) Hara, comb. nov.
Pleuropteropyrum mollifolium Kitagawa in Bot. Mag. Tokyo **50**: 75 (1936).
Aconogonum Nakaii (Hara) Hara, comb. nov.
Pleuropteropyrum Nakaii Hara in Journ. Jap. Bot. **10**: 231 (1934).
Aconogonum ochreatum (L.) Hara, comb. nov.
Polygonum ochreatum L., Sp. Pl. ed. 1, 361 (1753).
Aconogonum pamiricum (Korsh.) Hara, comb. nov.
Polygonum pamiricum Korsh. in Mém. Acad. Petrop. ser. 8, **4** (4): 98 (1896).
Aconogonum perigrinatoris (Paulsen) Hara, comb. nov.
Polygonum perigrinatoris Paulsen in Hedin, S. Tibet **6** (3): 87, t. 2, f. 4 (1922).
Aconogonum platyphyllum (Kitag.) Hara, comb. nov.
Pleuropteropyrum platyphyllum Kitagawa in Journ. Jap. Bot. **40**: 56 (1965).
Aconogonum riparium (Georgi) Hara, comb. nov.
Polygonum riparium Georgi, Bemerk. Reis. Russ. Reich **1**: 209 (1775).
Aconogonum rumicifolium (Royle) Hara, comb. nov.
Polygonum rumicifolium Royle ex Babington in Trans. Linn. Soc. **18**: 112 (1838).
Aconogonum sericeum (Pallas) Hara, comb. nov.
Polygonum sericeum Pallas, Reise **3**: 286 & 320 (1776).
Aconogonum sibiricum (Laxmann) Hara, comb. nov.
Polygonum sibiricum Laxmann in Nov. Com. Acad. Petrop. **18**: 531, t. 7, f. 2 (1774).
Aconogonum songoricum (Schrenk) Hara, comb. nov.
Polygonum songoricum Schrenk in Fisch. et Mey., Enum. Pl. Schrenk. **1**: 8 (1841).
Aconogonum tortuosum (D. Don) Hara, comb. nov.
Polygonum tortuosum D. Don, Prodr. Fl. Nepal. 71 (1825).
Aconogonum tripterocarpum (A. Gray) Hara, comb. nov.
Polygonum tripterocarpum A. Gray in Rothrock in Ann. Rep. Smiths. Inst. **1867**: 453 (1868).
Aconogonum Weyrichii (Fr. Schm.) Hara, comb. nov.
Polygonum Weyrichii Fr. Schmidt ex Maxim., Prim. Fl. Amur. 234 (1859).
var. **alpinum** (Maxim.) Hara, comb. nov.
Polygonum Weyrichii var. *alpinum* Maxim. in Bull. Acad. Sci. St.-Pétersb. **22**: 234 (1876).

Pol. amphibium L. and *Pol. orientale* L. are considered to be included in the genus.

Pol. perfoliatum L., *Pol. chinense* L., *Pol. molle* D. Don, and *Pol. campanulatum* Hook. f. have fleshy fruiting perianths, and Roberty & Vautier (1964) have associated them in the genus *Ampelygonum*, but these species seem not to be closely related one another. The first species with blue berry-like fruits belongs to sect. Echinocaulon, while *Pol. chinense* is near to *Pol. microcephalum* D. Don, as treated by Meisner (1832) and Steward (1930), and belongs to Sect. Cephalophilon. The latter two species are referred to the genus *Aconogonum*, as explained above (See page 67).

The species of sect. Cephalophilon including *Pers. nepalensis*, *Pers. microcephala*, *Pers. chinensis*, etc. have 3-colporate pollen grains (Pl. 30 e, g) and differ from other sections of *Persicaria* which have polyforate pollens. But their pollen grains have all very coarse reticulation on the surface.

Persicaria nepalensis (Meisn.) H. Gross of Himalaya is variable in the hairiness of leaves, and the colour of flowers. Although stipitate-glands near the top of upper internodes are often less conspicuous in the Japanese plants, they are otherwise indistinguishable from the Himalayan ones. In Japan, trigonous achenes have not been reported for this species, and the achenes are always lenticular, the styles are bifid in the upper part, and the stamens are 5.

Persicaria chinensis (L.) H. Gross.

The species is widely distributed in subtropical and warm-temperate regions of Asia from India south to Malaysia, and east to central China and the southern part of Japan, and is very polymorphic. In typical *P. chinensis*, the peduncles are densely glandular-setose, and the midribs of leaves are more or less setose with rigid hairs beneath.

Our Himalayan collections can be divided in two distinct races. One race has thick glabrous somewhat lustrous leaves, ochreae often foliaceous-auricled at the base, well-branched inflorescences, glandular-setose peduncles, and pinkish campanulate perianths thickly carnose in the lower part. Some specimens with ovate leaves agree well with the original figure of *Polygonum auriculatum* Meisner, and some with large ovate leaves with *Polygonum malaicum* Danser. While some collected from Ghorwa have narrower ovate-lanceolate leaves (see page 71).

The other Himalayan race has stems with stiff hairs at the nodes, ovate-lanceolate leaves crispate on the margin and shortly setose on the midrib beneath, membranaceous ochreae, shortly setose peduncles, and few-flowered heads. This form seems to agree with *Polygonum patens* D. Don, and is also near to *Polygonum brachiatum* Lamarck, but the type of the latter described from Monte Video of S. America has broader ovate leaves, and large foliaceous auricles at the base of ochreae.

Almost all Japanese specimens have glabrous ovate leaves, smooth or slightly setose peduncles with short rigid hairs, and white less carnose flowers, and belong to var. *Thunbergiana*1). Some specimens from Ryukyu and Formosa, however,

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1) *Persicaria chinensis* var. **Thunbergiana** (Meisn.) Hara, comb. nov.
Rumex umbellatus Houttuyn, Nat. Hist. II, **8**: 419, t. 47, f. 3 (1777).
Polygonum chinense α. *Thunbergianum* Meisner in Wall., Pl. Asia. Rar. **3**: 60 (1832).

show intermediate characters between the Japanese and typical Chinese ones.

Persicaria Posumbu (D. Don) H. Gross.

Our Himalayan specimens have leaves often densely long-hairy on both sides, strigose-hairy midribs and petioles, and slender but mostly continuous spikes. But the degree of hairiness of leaves are variable and the upper side of leaves becomes sometimes glabrescent. The flowers are pale pink, and the achenes are trigonous and small (2 mm long).

In Journ. Jap. Bot. **17**: 338–340 (1941), I agreed with the opinion of Danser and rejected *Pol. Posumbu* as an ambiguous name. After having examined a larger number of specimens from various regions, I came to the conclusion that *Pol. Posumbu* Ham. ex D. Don from Nepal should be adopted in a wide sense, including *Pol. caespitosum* Blume of Malaysia and *Pol. Yokusaianum* Makino of Japan. Although D. Don's original description is brief, *P. Posumbu* can safely be applied to the plant in question which is common in Himalaya, and clearly antedates Blume's *P. caespitosum.*

The Japanese specimens are consistently less hairy particularly on the underside of leaves and petioles, as compared with the Himalayan ones, and are referrable to var. *laxiflora* (Meisn.) Hara.[1] The spikes are often looser and remotely interrupted especially in f. *stenophylla.*[1]

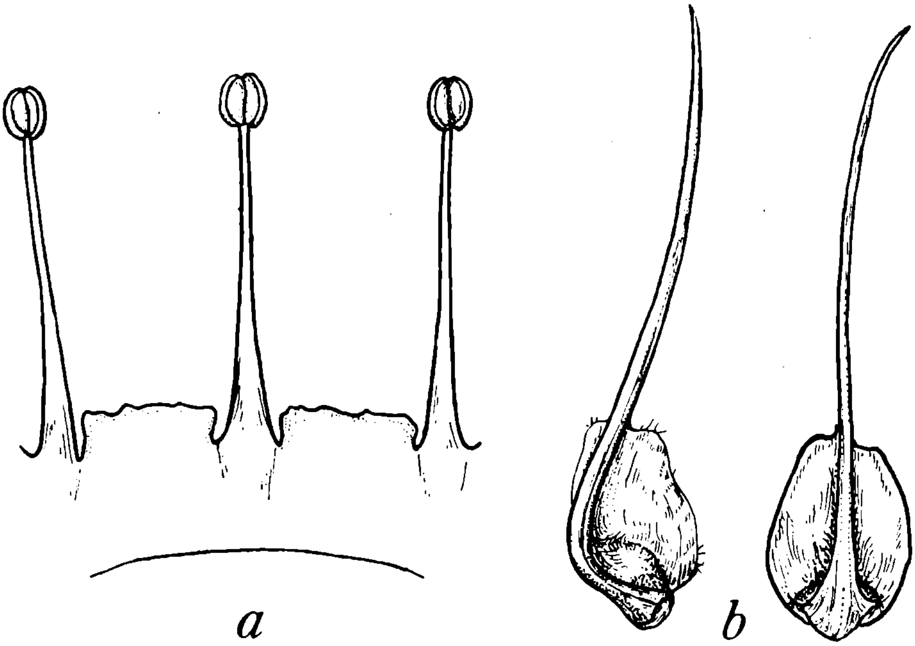

Fig. 57. *Achyranthes bidentata* Blume from E. Nepal.
a. Stamens and peudostaminodes, × 30.
b. Bracteoles (side and dorsal views), × 23.

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1) *Persicaria Posumbu* (D. Don) H. Gross var. **laxiflora** (Meisn.) Hara, comb. nov.
Polygonum caespitosum γ. laxiflorum Meisn. in Miq., Ann. Mus. Bot. Lugd.-Bat. **2**: 57 (1865).
Polyg. Yokusaianum Makino in Bot. Mag. Tokyo **28**: 116 (1914).
Persicaria Yokusaiana (Makino) Nakai in Rigakkai **24**: 301 (1926).
f. **stenophylla** (Makino) Hara, comb. nov.
Polyg. Yokusaianum var. *stenophyllum* Makino, l.c. 117 (1914).

Achyranthes bidentata Blume and its Japanese varieties.

This species is considerably variable. Our Himalayan specimens have thin leaves long acuminate at the apex and often densely clothed with more or less spreading hairs, slender rachis of spikes, bracteoles 3–4 mm long with oval basal wings 0.6–1 mm long, very acute sepals 4–5 mm long, and truncate quadrangular pseudostaminodes (Fig. 57).

The differences between *A. bidentata* and *A. japonica* noted by Nakai in Bot. Mag. Tokyo **34**: 39 (1920) are untenable. The Japanese plants are polymorphous, and at least two races are distinguishable in Japan, as pointed out by Okuyama in Journ. Jap. Bot. **10**: 262 (1934), but intermediate forms are sometimes found here and there. Var. *japonica* Miq. (*A. japonica* (Miq.) Nakai) closely resembles the Himalayan plants in general appearance, but is generally less hairy, and has more flat pseudostaminodes. Var. *hachijoensis* (Honda) Hara1) is a maritime variety with glabrescent shinning thicker leaves. In the shape of pseudostaminodes, the Himalayan plants are near to another Japanese variety, var. *tomentosa* (Honda) Hara1) (*A. Fauriei* Lév. et Vnt. 1904). The latter race, however, has thicker leaves shortly acuminate at the apex and often densely pubescent with long appressed hairs, thicker rachis, minute divaricate basal wings of bracteoles only 0.3–0.5 mm long, and is generally growing in sunny places. But the holotype of *A. Fauriei* Lév. et Vnt. (Faurie no. 4236) in Edinburgh has thinner leaves than a common form of var. *tomentosa*.

The relation between *Phytolacca acinosa* Roxb. of Himalaya and *P. esculenta* Van Houtte of Japan is explained on page 79.

In Caryophyllaceae, *Pseudostellaria cashmiriana* Schäftlein found on Phalut (ca. 3500 m alt.) is closely allied to *P. heterantha* (Maxim.) Pax, as pointed out by Mizushima in Journ. Jap. Bot. **38**: 151 (1963). *Stellaria monosperma* Hamilt. of Himalaya is represented in Japan by var. *japonica* Maxim. (see Mizushima in Journ. Jap. Bot. **32**: 249, 1957; **40**: 254, 1965).

In Ranunculaceae, the *Caltha palustris* group is differentiated into two distinct races both in Himalaya and Japan, and the interrelationship among them need further critical studies.

Stephania japonica (Thunb.) Miers is recently interpreted in a wide sense including the Himalayan plants by Forman in Kew Bull. **1956**: 49 (1956).

Magnolia globosa Hook. f. et Thoms. of Himalaya belongs to the same section as *M. Sieboldii* Koch of East China and Japan.

Litsea Cubeba (Lour.) Pers. closely resembles *Lindera citriodora* (Sieb. et Zucc.) Hemsl. of south Japan.

In Crassulaceae, it is noteworthy that *Sedum pseudosubtile* Hara which was newly

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1) *A. bidentata* Blume var. **tomentosa** (Honda) Hara, comb. nov.
A. Fauriei var. *tomentosa* Honda, Nom. Pl. Jap. ed. emend. 373 (1957).
var. **hachijoensis** (Honda) Hara, comb. nov.
A. japonica var. *hachijoensis* Honda in Bot. Mag. Tokyo **46**: 371 (1932).

found by our Expedition in Sikkim is closely allied to *S. subtile* Miquel of Japan.

Drosera peltata Smith var. *lunata* (Hamilt.) Clarke of Himalaya is indistinguishable from that of Japan.

Hydrobryum Griffithii (Wall.) Tulasne differs *H. japonica* Imamura by the shape of stigma, but they are undoubtedly very closely related each other, as mentioned in Journ. Jap. Bot. **39**: 185 (1964). The distribution of the genus is given in Fig. 15.

In Saxifragaceae, *Tiarella polyphylla* D. Don of Himalaya agrees well with that of Japan with roundish leaf-lobes. *Chrysosplenium nepalense* D. Don corresponds to *C. Grayanum* Maxim. of Japan, *Philadelphus tomentosus* Wall. to *P. Satsumi* Siebold of Japan, and *Hydrangea robusta* Hook. f. et Thoms. to *H. involucrata* Siebold.

Hydrangea anomala D. Don, and **H. petiolaris** Sieb. et Zucc. (*H. anomala* subsp. *petiolaris* McClintock).

In our Himalayan collections, the normal flowers have 11–14 stamens up to 4 mm long, and distinct ovate-triangular calyx-lobes 0.5–1 mm long. The leaves are ovate and long-pointed, often with coarse teeth, and the flowering branches bear only few small leaves.

While in the Japanese plants, the normal flowers are 10–15 mm in diameter, with spreadig 20–26 stamens which are unequal in length and 3–8 mm long. As compared with typical *H. anomala*, they tend to have more leafy flowering branches, more roundish leaves with more abruptly acuminate tip and more sharply pointed teeth, and more depressed low (0.2–0.5 mm) calyx-lobes, although they cannot be clearly separated by any single character.

In Rosaceae, the *Agrimonia Eupatoria—A. pilosa* group in Eurasia needs a thorough revision. In Himalaya, it is represented by *A. pilosa* var. *nepalensis* (D. Don) Nakai which has densely pubescent stems, rachises, and leaflets with spreading hairs, oblong petals, and about 10 stamens. In Japan this group is differentiated into several intricate races.

All seven species of *Fragaria* hitherto recorded from Himalaya and Japan are diploid. *F. nubicola* Lindley of Himalaya is very near to *F. nipponica* Makino of Japan. In *F. nubicola*, the hairs on petioles are almost appressed, and those on the upper side of leaflets are ascending, while in *F. nipponica*, the hairs on petioles and the upper side of leaves are mostly spreading, and the leaves die in winter even in a green house. The *Duchesnea indica* group was cytotaxonomically studied by Hara and Kurosawa in Journ. Jap. Bot. **34**: 165 (1959). In Himalaya, only a dodecaploid race has hitherto been confirmed (see page 660).

The *Potentilla fruticosa* group of Himalaya and Japan is referred to var. *arbuscula* (D. Don) Maxim., but the plants from the two regions seem to be slightly different each other. The difference between *Potentilla Kleiniana* Wight of Himalaya and W. China and *P. anemonefolia* Lehm. of Japan and N. & C. China was pointed out by Hand.-Mzt. (1933), and Murata regarded the latter as a subspecies of *P. Kleiniana* in Act. Phytotax. Geobot. **21**: 89, fig. (1965).

Rubus sumatranus Miq. with very long glandular hairs is widely distributed from subtropical Himalaya through China to south-west Japan. *R. asper* D. Don is closely related to *R. croceacanthus* Lév. of Japan which has more coarsely serrate leaflets glandular-setose mainly on nerves beneath, and more roundish fruits with a thinner stipe. *Rubus calycinus* Wall. looks like *R. pectinellus* Maxim. of Japan except for the shape of stipules.

The taxonomy and nomenclature of the *Aruncus dioicus* (*A. silvester*) group in Eurasia and North America were discussed in detail in Journ. Jap. Bot. **30**: 65–69 (1955).

Spiraea micrantha Hook. f. and **S. japonica** L. f.

As compared with *S. bella* Sims, *S. micrantha* Hook. f. of E. Himalaya has more ovate thinner leaves with longer acuminate apex, larger (up to 20 cm across) densely tomentose corymbs, smaller (4–5 mm across) whitish hermaphrodite flowers, and smaller (about 1.5 mm long) densely pubescent and more diverging follicles. The species is hardy in Tokyo, and it differs also from *S. japonica* in having whitish flowers, shorter stamens, and smaller densely pubescent follicles.

S. bella Sims is dioecious and has deep pink-rose unisexual flowers. The male flowers are larger than the female ones, and have stamens longer than the petals which are 2–3 mm long. The follicles are suberect, about 2 mm long, and pubescent on the inner suture.

S. japonica L. f. of Japan and Korea is exceedingly variable in the shape, size, texture, and hairiness of leaves, the mode of serration, and the hairiness of corymbs and calyces, as mentioned by Koidzumi in Bot. Mag. Tokyo **43**: 400 (1929) and by Kitamura in Act. Phytotax. et Geobot. **14**: 156 (1952). The branches are upright, terete, or ridged in most specimens of Kyushu. The flowers are normally hermaphrodite, 5–7 mm in diameter, and deep to light pink-rose (rarely white). The stamens are long exserted, and the longer ones are about twice as long as the petals, attaining 4–6 mm long. The follicles are generally suberect with spreading styles, 2–3 mm long (the body only), and glabrous excepting on the inner suture.

In Leguminosae, the species common to Himalaya and Japan are *Aeschynomene indica* L., *Albizia Julibrissin* Durazzini, *Crotalaria sessiliflora* L., and *Smithia ciliata* Royle. In *Amphicarpaea bracteata* (L.) Fernald, the Himalayan plants belong to typical subsp. *Edgeworthii* (Benth.) Ohashi, and the corresponding Japanese plants to var. *japonica* (Oliver) Ohashi (see page 139). *Cassia Nomame* (Sieb.) Honda of Japan was regarded as a subspecies of widespread *C. mimosoides* L., and *Zornia cantoniensis* Mohlenbr. as a variety of *Z. gibbosa* Spanoghe by Ohashi (see pages 144 & 166). The genus *Desmodium* especially the *D. oxyphyllum* group was critically treated by Ohashi in Journ. Jap. Bot. **40**: 363–369 (1965) and **41**: 148–155 (1966).

Geranium nepalense Sweet and subsp. **Thunbergii** (Sieb. et Zucc.) Hara.

In the Himalayan plants, the stems are rather slender and pilose with more or less retrorse eglandular hairs; the leaves are 5-lobed, the upper ones are often 3-lobed, and hairy on both sides; the peduncles are slender, bearing 2 or 1 flower which is purple-rose, or whitish with purple veins, and 8–12 mm in diameter, and the capsule-beaks are minutely hairy.

On the other hand, the Japanese plants[1] tend to have robust stems with spreading (glandular) hairs in the upper part, 3-lobed upper leaves which are hairy on nerves beneath, leaf-lobes with fewer coarse 1–3 teeth on both sides of the lobe and longer acuminate tip, always 2-flowered peduncles with patent often glandular hairs, and densely pubescent hairy capsule-beaks with short hairs and long spreading glandular ones.

But they are considerably variable, and f. *glabratum* Hara which is not uncommon in Japan totally lacks long spreading glandular hairs, and some slender individuals often found in mountain districts of Honshu are almost indistinguishable from *G. nepalense* of Himalaya.

The number of chromosomes is the same in the Himalayan and Japanese plants.

Oxalis Acetosella L. and subsp. **Griffithii** (Edgew. et Hook. f.) Hara.

Both in Sikkim and Japan, *O. Acetosella* occurs at higher altitudes than subsp. *Griffithii*. It was collected in the Singalila range in *Rhododendron* scrubs above 3000 m high, and it is growing in Japan generally on mossy beds in the coniferous zone. The rhizomes are slender, and the leaflets are obcordate with round lobes. But in Honshu of Japan, the plants showing intermediate characters between *O. Acetosella* and subsp. *Griffithii* are sometimes met with.

The subspecies *Griffithii* differs from *O. Acetosella* by thicker rhizomes, larger more obtriangular leaflets with more divaricate obtuse lobes, longer capsules, and larger seeds. As discussed in Journ. Jap. Bot. **30**: 21 (1955), the Eastern Himalayan plants agree well with the Japanese ones. A range of variations, however, is much wider in Japanese populations, and they are variable in the mode of rhizomes, and the shape and size of leaflets. Their leaves are quite glabrous from the first or sparsely pilose with appressed hairs. Our Himalayan specimens have young leaves generally sparsely hairy with appressed longer hairs even on the upper surface.

The chromosome number is generally $2n=22$ both in Japan and Eastern Himalaya, but some populations with different chromosome numbers seem to occur in Japan and Himalaya (see also page 661).

The differences between *Boenninghausenia albiflora* (Hook.) Meisner of Himalaya and its var. *japonica* (Nakai) S. Suzuki of Japan are slight. In the Himalayan plants, the stems become more suffrutescent, and the young parts are generally pubescent and tinged with brown.

Two Eastern Himalayan species of *Skimmia*, *S. arborescens* T. Anders. and *S. melanocarpa* Rehder et Wilson, have acuminate leaves and black fruits (see Journ.

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1) *Geranium nepalense* Sweet subsp. **Thunbergii** (Sieb. et Zucc.) Hara, stat. nov.

G. Thunbergii Sieb. et Zucc. in Abh. Akad. Wiss. Muench. **4** (2): 136 (1845)–Lindley et Paxton, Fl. Gard. **1**: 186 (1850–51).

G. nepalense var. *Thunbergii* (Sieb. et Zucc.) Kudo, Medic. Pl. Hokkaido t. 55 (1922)–Hara, Enum. Sperm. Jap. **3**: 3 (1954).

Jap. Bot. **40**: 68, 1965). *S. japonica* Thunb. of Japan has leaves obtuse at the tip, tetramerous flowers, and bright red fruits. It is interesting that black-fruited species are distributed only in Eastern Himalaya and West China, while red-fruited species occur in Western Himalaya, East China, and Japan.

Mercurialis leiocarpa Sieb. et Zucc. of Euphorbiaceae is distributed from Himalaya to Japan. *Securinega suffruticosa* (Pallas) Rehder also occurs from Himalaya to Japan, but the Japanese plants are somewhat different from the Himalayan ones.

In Anacardiaceae, *Rhus javanica* L., *R. succedanea* L., and *Choerospondias axillaris* (Roxb.) Burtt et A. W. Hill are common to Himalaya and Japan.

Ilex crenata Thunb. is represented by var. *Thomsoni* (Hook. f.) Loesen. in Eastern Himalaya. The species is very polymorphic in Japan, and the interrelations among varieties need further studies.

Euonymus vagans Wall. is closely allied to *E. Fortunei* (Turcz.) Hand.-Mzt. of China and Japan.

Euonymus Hamiltonianus Wall. and subsp. **Sieboldianus** (Blume) Hara.

E. Hamiltonianus of Himalaya closely resembles *E. Sieboldianus* of China and Japan. Our Himalayan collections have dusty purple young anthers, shallowly 4-lobed fruits 5–8 mm long 7–10 mm in diameter and deeply depressed in center at the top, and seeds 5–6 mm long enclosed with an arillus having a closed slit on the back. The leaves are persistent throughout winter, when kept in a glass house in Japan.

In Japan, *E. Sieboldianus* shows a wider range of variations, but its leaves are always deciduous. The young anthers are dark red, the fruits are 7–10 mm long and 7–13 mm in diameter, and shallowly depressed at the top, and the seeds are 5-9 mm long with a closed or open arillus.

These differences seem to be not enough to separate the Japanese plants specifically from the Himalayan ones, and I wish to treat the former as a geographical subspecies¹⁾ of *E. Hamiltonianus*.

Sapindus Mukorossi Gaertn. is distributed from Himalaya through China to Japan.

Hovenia acerba Lindl. was specifically distinguished from *H. dulcis* Thunb. of Japan and China by Y. Kimura (1939), but it is doubtful if *H. acerba* is growing wild in Himalaya or was introduced from China.

Cayratia japonica (Thunb.) Gagnep. is widely distributed from S. E. Asia to Japan and Malaysia, and is represented in Himalaya by var. *mollis* (Planch.) Momiyama which may merit specific recognition. *Vitis lanata* Roxb. is near to *V. kiusiana*

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1) *Euonymus Hamiltonianus* Wall. in Roxb., Fl. Ind. ed. Carey, **2**: 403 (1824).
subsp. **Sieboldianus** (Blume) Hara, comb. nov.
E. Sieboldianus Blume, Bijdr. 1147 (1826)–Hara, Enum. Sperm. Jap. **3**: 91 (1954).
var. **megaphyllus** (Hara) Hara, comb. nov.
E. Sieboldianus var. *megaphyllus* Hara in Bot. Mag. Tokyo **50**: 191 (1936); l.c. 91 (1954).
var. **sanguineus** (Nakai) Hara, comb. nov.
E. Sieboldianus var. *sanguineus* Nakai in Bot. Mag. Tokyo **40**: 493 (1926)–Hara, l.c. 91 (1954).
var. **stenophyllus** (Koidz.) Hara, comb. nov.
E. Vidalii var. *stenophyllus* Koidzumi in Bot. Mag. Tokyo **31**: 32 (1917).

Momiyama of Kyushu.

From Himalaya, *Eurya japonica* Thunb. has often been reported, but the Himalayan plants are different from the Japanese ones and belong to *E. acuminata* DC. or *E. cavinervis* Vesque (see page 208).

Norysca Urala (Ham.) Koch is very closely allied to *N. patula* (Thunb.) Blume which is often naturalized in Japan. A weedy small herb, *Sarothra laxa* (Bl.) Y. Kimura, is widespread from Himalaya to Japan, and south to Australia.

Viola biflora L. and *V. diffusa* Gingins are species common to Himalaya and Japan, but they are considerably variable.

Stachyurus himalaicus Hook. f. et Thoms. and **S. praecox** Sieb. et Zucc.

The genus is very polymorphous in West China, and several closely allied species have been described based on the differences in the shape, size, and serration of leaves, the length of spikes, the size of flowers, and the length of style. But some of those characters are very variable, and critical reexaminations on living material are necessary.

S. himalaicus is very closely related to *S. chinensis* Franch. of China, and *S. praecox* Sieb. et Zucc. of Japan, and the differences between them are rather slight. Li (1943) and Wang & Tang (1951) excluded *S. praecox* from China, but Fang (1945) referred the plants from East China to *S. praecox.*

In *S. himalaicus,* the leaves are oblong to elliptic, long caudate-acuminate at the apex, and minutely and closely serrate with sharp teeth, the flowers are small and 4–5 mm long, and the fruits are oval, 8–10 mm long and 6–8 mm across when fresh in our material from Minchin Dhap.

The Japanese plants, although variable in the shape and size of leaves, and the size of flowers and fruits, are considered to belong to a single species, *S. praecox* (cf. Hara, Enum. Sperm. Jap. **3**: 229, 1954). The leaves are generally broader and often ovate, shorter acuminate at the apex, and more coarsely serrate with incurved obtuse teeth, the spikes 1.5–12 cm long, the flowers campanulate and 5–8 mm long, and the fruits 8–15 mm long and 7–9 mm across.

The flowers of *Stachyurus* look like hermaphrodite, but are functionally dioecious. In the plants which do not set fruit, their stamens are nearly as long as a pistil, and fertile. Whereas in functionally female plants, their spikes are shorter, their flowers smaller and more greenish, their stamens shorter than a pistil, their anthers often white and sterile, and their ovary is more thickened.

Edgeworthia Gardneri (Wall.) Meisner, and **E. chrysantha** Lindley (*E. papyrifera* Sieb. et Zucc.).

In Himalayan *E. Gardneri,* the branchlets are slender and often spreading; the leaves of firmer texture, oblanceolate to elliptic, and persistent; the peduncles are slender, 1.5–5 cm long; the involucral bracts are narrower, linear to lanceolate, often elongate, not very silky; the flowers are coetaneous, fragrant; the ovary is densely hispid throughout. But in Yunnan, the leaves are said to be not persistent through the winter, and in northern Burma, the flowers are precocious.

E. chrysantha, a native of south and central China, has long been cultivated in

Japan for raw material of Japanese paper. The branchlets are stouter; the leaves of thinner texture, lanceolate to oblong, acute at the apex, and deciduous; the peduncles are stout, 0.8–2 cm long; the involucral bracts are shorter, elliptic, and silky; the flowers are precocious and inodorous; the ovary is generally silky-hairy only near the apex.

Besides these morphological differences, the chromosome number of *E. chrysantha* has been reported to be n=18 and 2n=36 by Sugiura (1936) and Nishiyama & Watanabe (1960), while that of *E. Gardneri* to be n=9 by Arora (1962). Taking all these facts into consideration, *E. chrysantha* can be considered as a separate species from *E. Gardneri.*

Circaea alpina L. is represented in Himalaya only by subsp. *imaicola* (Asch. et Magnus) Kitamura which has minutely pubescent stems, and less cordate leaves. This subspecies seems to be connected with the typical glabrous race through var. *pilosa* (Hara) Hara which occurs in Japan together with typical *C. alpina.*

The Japanese plants of the *Ludwigia adscendens* (*Jussiaea repens*) group were first distinguished from the typical Indian ones by Ohwi (1951), and were recently regarded as a subspecies of *L. peploides* by Raven (1963). But I wish to treat the Japanese plants as a subspecies of *L. adscendens*[1]. The difference between *Ludwigia prostrata* Roxb. and *L. epilobioides* Maxim. of Japan, Amur, and China was clearly pointed out by Raven (1963).

Panax pseudo-Ginseng Wall. and **P. japonicus** C. A. Meyer.

The genus *Panax* is generally classified into 5 species, of which two are American. The Himalayan plants have been referred to *P. pseudo-Ginseng* Wall., but are variable in the shape and hairiness of leaflets, and especially in the shape of rhizomes (Fig. 58). The Wallich's type of *P. pseudo-Ginseng* from Sheopore, Nepal (1821) has large carrot-like roots without a creeping rhizome, and broader leaflets 7–12 cm long and 2.5–4 cm wide, as illustrated by Wallich in 1831. Only a very few specimens match this type, and most of our Himalayan collections have long creeping rhizomes rarely bearing 1–2 tubers at the tip, and narrow lanceolate to oblong leaflets 5–18 cm long 1–3 cm wide ending in a long caudate apex, and with sharp cuspidate teeth on the margin. The latter race is referrable to var. *angustifolius* (Burkill) Li. The leaflets are bristly on veins above, or on both sides; the fruits are subglobose 8–9 mm long and 6–8 mm across; the seeds not compressed 4.5–5 mm long and 3–4 mm thick; the pollen grains are 23–25 μ across with very fine obscure reticulation; and the somatic chromosome number is 48 (see Kurosawa on page 661).

Another race, var. *bipinnatifidus* (Seem.) Li, has pinnatifid leaflets with their

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1) *Ludwigia adscendens* (L.) Hara in Journ. Jap. Bot. **28**: 290 (1953).
subsp. **stipulacea** (Ohwi) Hara, comb. nov.
Jussiaea stipulacea Ohwi in Journ. Jap. Bot. **26**: 232 (1951).
Ludwigia adscendens var. *stipulacea* (Ohwi) Hara, l.c. 291 (1953).
L. peploides subsp. *stipulacea* (Ohwi) Raven in Reinwardtia **6**: 397 (1963).

lobes again pinnatifid or incise-serrate, and always long creeping rhizomes with incrassate nodes. It occurs locally in Sikkim, Bhutan, N. Assam, S. E. Tibet, N. Burma, and China (Szechuan, Yunnan, Kansu, Shensi, Hupeh). Although the extreme form is very marked, it is connected with var. *angustifólius* through intermediate forms.

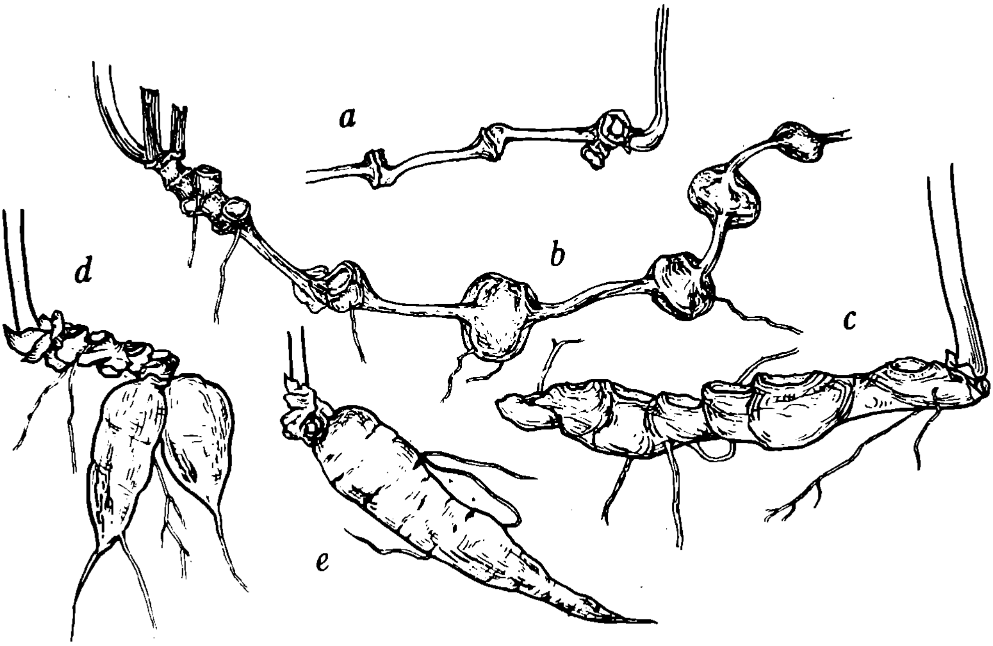

Fig. 58. Rhizomes and roots of *Panax pseudo-Ginseng*, × 2/3.
a. Var. *bipinnatifidus* from Bakkim-Jongri, Sikkim.
b. Var. *bipinnatifidus* from below Bakkim, Sikkim.
c. Var. *angustifolius* from Ghum-Lopchu, Darjeeling.
d. Var. *pseudo-Ginseng* from Lopchu, Darjeeling.
e. Var. *pseudo-Ginseng*, the typical form from Nepal.

In *P. japonicus* C. A. Meyer of Japan, the rhizomes are usually creeping and thick, the leaflets are elliptic to obovate, 6–18 cm long 2.2–6.5 cm wide, serrate or incised-serrate on the margin but never pinnatifid and are glabrous or bristly on nerves. Forma *angustatus* (Makino) Hara which occurs in the Tokai district of Honshu has narrower leaflets similar to those of *P. pseudo-Ginseng* var. *angustifolius*, but they are less pointed at the apex and less bristly than those of the latter. The fruits are globose, 6–9 mm long and 6–10 mm broad; the pollen grains are 24–26 × 27–28.5 μ with fine reticulation; and the chromosome number is $2n=48$. As compared with the Himalayan plants, the Japanese ones tend to have broader leaflets with a shorter pointed apex and less pointed teeth, and less bristly on veins. Although the range of variations in both plants is not the same, the outer morphological differences between the two are slight.

In China, the genus *Panax* is most differentiated. *Panax Ginseng* C. A. Meyer (*P. Schin-seng* Nees) of northernmost China and Ussuri has carrot-like roots, elliptic to ovate-elliptic leaflets, broader laterally flattened fruits, larger flattened seeds, pollen grains 26–28 × 29–31 μ in size with coarser reticulation, and 44 or 48 somatic chromosomes. The plant is cultivated in Korea and Japan for its root called 'Ginseng' (人参) which is highly esteemed for medicinal purpose.

Another esteemed drug in China, 'Sanchi' (三七) is typically the rhizomes of *P. notoginseng* (Burkill) Chen (1946) (*Aralia pseudo-Ginseng* var. *notoginseng* Burkill) cultivated in E. Yunnan and W. Kwangsi. The rhizomes are long and thick, the leaflets 7–17×3–5.5 cm, and very similar to those of typical *P. pseudo-Ginseng*, the fruits broad cocoon-shaped, and the seeds larger and subglobose.

Aralia quinquefolia var. *major* Burkill and var. *elegantior* Burkill both described from Hupeh are morphologically indiscriminable from the Japanese plants. Some specimens from Yunnan, Szechuan, and even from N. Burma are almost identical with the Japanese one in the characters of rhizomes, leaflets, and fruits. On the other hand, the race which agrees well with Himalayan *P. pseudo-Ginseng* var. *angustifolius* occurs in Yunnan (Forrest 8258) and Szechuan (Faber 141), and var. *bipinnatifidus* is found in western and central China.

So the treatment of Chinese *Panax* widely differs by botanist. Except for *P. Ginseng*, Li (1942) referred all other Chinese plants to *P. pseudo-Ginseng*, whereas P'ei and Chou (1958) recognized 4 species from China, i.e. *P. bipinnatifidus*, *P. major*, *P. japonicus*, and *P. pseudo-Ginseng*. Jzushritzky in his monographic work (1961) mostly followed Li's opinion, but regarded *P. bipinnatifidus* as an independent species, and considered *P. japonicus* as an endemic species to Japan.

The chemical constituents, especially Saponins and Sapogenins, are now investigated in detail by Prof. S. Shibata and his associates[1] of Faculty of Pharmaceutical Sciences, University of Tokyo. Typical *P. pseudo-Ginseng* of Nepal with carrot-like roots should be carefully compared with other races. It is noteworthy that most of the Himalayan plants is very near to the Japanese ones in many respects. The Asiatic plants warrant further critical studies in the field.

In Umbelliferae, *Centella asiatica* (L.) Urban is very widespread. Himalayan *Pimpinella diversifolia* DC. is slightly different from the Japanese one in the shape of upper cauline leaves (see page 230).

Hydrocotyle nepalensis Hooker.

The plants of this group have often been lumped in *H. javanica* Thunberg, but *H. nepalensis* is clearly separable from the latter, as I have pointed out in Journ. Jap. Bot. **17**: 342 (1941). The Japanese plants agree with typical *H. nepalensis* illustrated by Hooker which has somewhat roundish lobes of leaves. Some of our Himalayan plants, however, have more acute triangular lobes of leaves.

H. podantha Molkenb. is also a quite distinct species. *H. nepalensis* of Himalaya has somewhat triangular leaf-lobes with spreading thick hairs above, 2–3-aggregate shorter peduncles, light green flowers, and shorter stamens 0.8 mm long. Whereas, *H. podantha* has always depressed low roundish leaf-lobes with only very short hairs above, long (up to 5 cm) solitary peduncles, slender pedicels 2–7 mm long, nearly white flowers, and long exserted stamens about 1.5 mm long.

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[1] Yakugaku Zasshi **85**: 753 (1965).

Sanicula elata Hamilt. ex D. Don and **S. chinensis** Bunge.

The relations between the two species were discussed in Journ. Fac. Sci. Univ. Tokyo Bot. **6**: 93 (1952), and also by Hara and Kurosawa in Journ. Jap. Bot. **38**: 74 (1963).

In *S. elata*, all leaf-segments including those of radical leaves are acute at the top, and the veins are not at all impressed above; the umbellules consist of 2–3 hermaphrodite flowers and 1–4 stipitate male flowers, and the fruits are 2 mm long excluding persistent calyx.

In *S. chinensis* of Japan, China, and Ussuri, the radical leaves especially outer ones have obovate leaf-segments with a roundish top, and the leaf-veins are always distinctly impressed above. The sexual differentiation in flowers is very prominent, and the hermaphrodite flowers with large ovary are about twice as large as the male flowers. The fruits are larger, 3–4 mm long (excluding calyx and prickles) with stout uncinated prickles.

Aucuba himalaica Hook. f. et Thoms. and **A. japonica** Thunb.

The genus *Aucuba* has been known to include three main species, *A. himalaica* Hook. f. et Thoms., *A. chinensis* Benth., and *A. japonica* Thunb., although in recent years 4 additional species have been described from central and western China based on slight morphological differences. *A. himalaica* is distributed from Sikkim to Manipur, *A. chinensis* from N. Burma through China to Formosa, and *A. japonica* from Ryukyu, southernmost Korea to Japan (see Fig. 59).

The Himalayan plants are rather uniform, and have narrower ±oblong leaves densely hairy beneath when young, with a long-acuminate tip and distinctly impressed veins on the upper surface, densely hairy rachis of inflorescences, and long-acuminate petals. It is diploid with 16 somatic chromosomes, and in Sikkim it

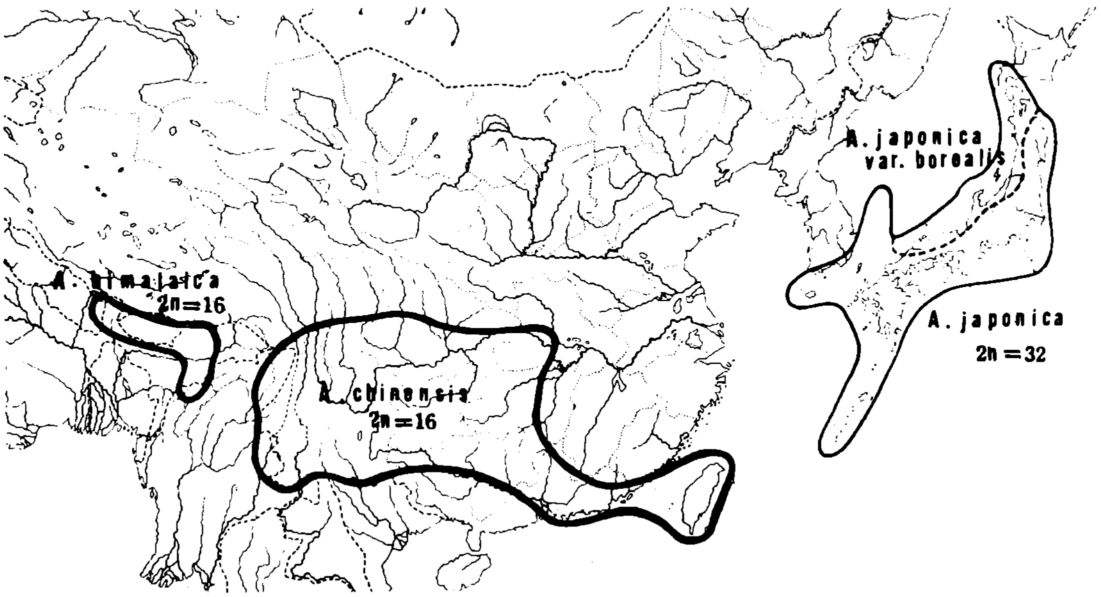

Fig. 59. Distribution map of the genus *Aucuba*.

occurs locally in evergreen oak forests between 2000–2700 m high.

On the contrary, *A. japonica* has generally broader glabrous leaves with a shortly acute or acuminate apex and less impressed veins, and acute or apiculate petals, and it is tetraploid ($2n=32$). It is common in the warm-temperate zone of Japan, and is easily cultivated in various parts of the world. Its variety *borealis* Miyabe et Kudo with lower stems and smaller leaves is also tetraploid, and occurs on the Japan-Sea side of Japan as far north as south-west Hokkaido. The variety is considered to have been differentiated from *A. japonica* in the latter part of the Quaternary glaciation, adapted to the Japan-Sea type of climate with heavy snowfall in winter.

A. chinensis shows somewhat intermediate characters between *A. himalaica* and *A. japonica.* It has petals caudately acuminate as in *A. himalaica*, but has less hairy young leaves and inflorescences, and often more resembles *A. japonica* in leaf-shape. *A. chinensis* from Formosa was reported to be diploid. The type of *A. chinensis* from Hong Kong has large thick glabrescent leaves oblong to elliptic with a shortly acuminate tip and large coarse teeth on the margin, inflorescences with scattered hairs only, and acutish petals of female flowers. The leaves of *A. chinensis*, however, are extremely variable in C. and W. China. Some specimens have narrow lanceolate leaves with minute teeth or with a few coarse teeth, and others have obovate or obtriangular leaves truncate with an acuminate tip, and with large coarse teeth in the upper part.

Some specimens from Mt. Omei of Szechuan agree well with *A. chinensis* in leaf-shape, while the other from the same locality resembles more *A. himalaica,* but has less hairy leaves and inflorescences. Also some from Yunnan are the same as *A. himalaica* in leaf-shape and petals, but are less hairy than the latter. Some specimens from Manipur are identical with *A. himalaica,* but the other has thick leaves less pointed at the apex. Those from Delei Valley of Assam have somewhat broader leaves more sharply serrate than those of *A. himalaica.* In general the plants tend to be more hairy to the west. Taking the similar wide variations in leaves of *A. japonica* into consideration, I agree with the opinions of Rehder and Li in regarding all forms in China above mentioned as a single species, and *A. chinensis* can even be regarded as a geographical race of *A. himalaica.*

In *Aucuba,* it is evident that polyploidy has played an important role in evolution of the genus. As compared with diploid species, tetraploid *A. japonica* is much more vigorous in growth, and shows a much wider range of tolerance. Even in Darjeeling, *A. japonica* is growing more luxuriantly and is more easily cultivated than diploid *A. himalaica* which is native in the district.

Helwingia himalaica Hook. f. et Thoms. and **H. japonica** (Thunb.) Dietrich. The genus *Helwingia* is very characteristic in having epiphyllous flowers. It is distributed from Eastern Himalaya, China, and Japan, and in general three species can be distinguished, i.e. *H. himalaica* Hook. f. et Thoms., *H. chinensis* Batalin, and *H. japonica* (Thunb.) Dietrich (see Fig. 60).

As compared with *H. japonica, H. himalaica* has generally narrower and sometimes persistent leaves with a long caudately acuminate apex and dense acute teeth on the margin, needle-shaped sometimes crenate stipules, slightly smaller male flowers about 3 mm across, and red fruits. The pollen grains are 18–19 × 19–20 μ in size, and the species was proved to have 38 somatic chromosomes (cf. page 662). Handel-Mazzetti identified a specimen from Bhutan as *H. japonica*, but it seems to be a broad-leaved form of *H. himalaica*. So far as I have examined, no typical *H. himalaica* has been found from Yunnan or Szechuan.

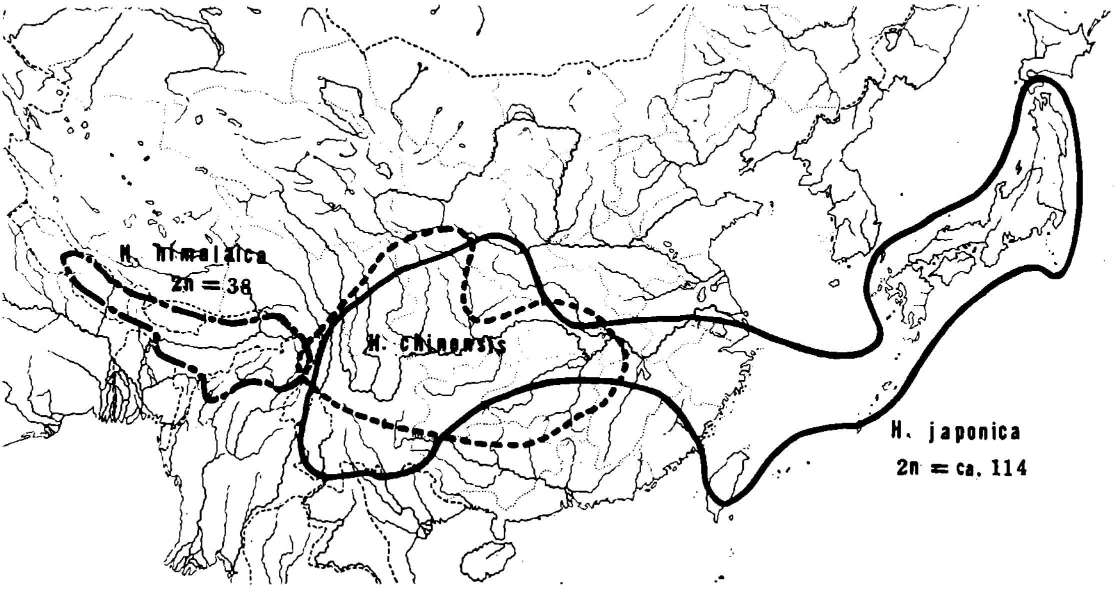

Fig. 60. Distribution map of the genus *Helwingia*.

While the Japanese plants have generally more roundish leaves acuminate at the apex, generally deeply fimbriate stipules, larger male flowers 4–6 mm across, and black fruits. The pollen grains are 21–22 × 22–24 μ in size, and the chromosome number for *H. japonica* has hitherto been reported as 2n=80, 114, 120, or 144 (cf. page 662). Outside Japan, *H. japonica* occurs in central and western China westwards to West Yunnan and Szechuan, and the Chinese material well agrees with the Japanese one in the shape of leaves, the floral characters, and the colour and size of fruits. Although the Chinese plant has never been studied cytologically, it is probable that it belongs to a similar high polyploid to the Japanese, because the size of pollen grains from a specimen of Yunnan is the same as that of the Japanese plants. *H. formosana* Kanehira et Sasaki from Formosa, and *H. liukiuensis* Hatusima from Ryukyu may also fall within the variations of *H. japonica*. The size of fruits (3 mm) given by Li for *H. formosana* is too small for the ripe ones.

The third species, *H. chinensis*, has narrow lanceolate subcoriaceous leaves less than 2 cm wide, capillary longer (2–15 mm) pedicels in male flowers which are 3–4 mm across, and red fruits in its typical form. But some specimens have larger broader (2–4 cm) oblong leaves attenuate to both ends, and shorter pedicels, and they are referrable to var. *crenata* (Lingelsh.) Fang, though the colour of fruits in this variety is uncertain. The size of pollen grains of *H. chinensis* is 18–19 × 19–20 μ, and *H. chinensis* is more closely related to *H. himalaica* than to *H. japonica*. The specimens from N. E. Burma identified by Hand.-Mzt. as *H. himalaica* belong to *H. chinensis*, and some from Yunnan and Szechuan reported as *H. himalaica* also seem to agree with *H. chinensis* or its var. *crenata*.

Monotropa uniflora L. and **Monotropastrum humile** (D. Don) Hara.

It is interesting that both *Monotropa uniflora* and *Monotropastrum* occur from Himalaya through China to Japan. Their taxonomy, nomenclature, and distribution were treated in detail in Journ. Fac. Sci. Univ. Tokyo Bot. **6**: 349 (1956), Journ. Jap. Bot. **36**: 78–80 (1961) and **40**: 100–102 (1965). *Monotropa uniflora* flowers generally later than *Monotropastrum* in autumn both in Himalaya and Japan, and all specimens collected before or in July belong to *Monotropastrum*.

Monotropastrum is exceedingly variable especially in the size of stems, flowers and fruits, the shape of scaly leaves, tepals and ovary, and the number of tepals, stamens and placentae, even in the same colony. A wide range of variations in the Japanese plants was described and illustrated in Icon. Pl. Asia.-Or. **4**: 327, t. 109 (1941), and the similar variations were also observed in the Himalayan ones. I have examined a large number of living and herbarium specimens from various localities, and have arrived at the conclusion that it is better to treat all of them as a single species, *M. humile* (D. Don) Hara.

As compared with the Himalayan plants, however, the Japanese ones have thicker petals which are broad, hairy inside, and more distinctly saccate at the base, densely villose filaments with thicker (30–50 μ thick) hairs, and more distinctly papillose anthers. So the latter is regarded as a geographical race, var. *tripetalum* (Makino) Hara. The size of pollen grains is almost the same in both races.

In Ericaceae, *Rhododendron* is highly differentiated in Himalaya and all species are evergreen, while in Japan only a few evergreen species are found, and deciduous species are well differentiated. In Himalaya, some evergreen species of *Rhododendron*, *Agapetes*, and *Vaccinium* are epiphytic, but all Japanese species are terrestrial.

Gaultheria pyroloides Hook. f. et Thoms. has once been confounded with *G. Miqueliana* Takeda of Japan, but they are quite distinct. *Pieris formosa* (Wall.) D. Don corresponds to *P. japonica* (Thunb.) D. Don of Japan.

Enkianthus deflexus (Griff.) Schneid. and **E. campanulatus** (Miq.) Nichols.

E. deflexus of Eastern Himalaya has generally oblong leaves attenuate to both ends, short subumbellate racemes, broader campanulate corollae 10–15 mm wide, style pubescent below the middle with spreading hairs, sparsely and finely hairy ovary, minutely pubescent anthers, and roundish oval capsules (5–) 7–9 mm long.

The specimen from between Batasi and Palmajua has young leaves almost glabrous beneath, and thus approaches to *E. chinensis*. It seems better to treat *E. chinensis* as an eastern race of *E. deflexus*1), as suggested by E. H. Wilson.

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1) *Enkianthus deflexus* (Griff.) Schneid.
var. **chinensis** (Franch.) Hara, comb. nov.
E. chinensis Franchet in Journ. de Bot. **9**: 371 (1895)–Sealy in Bot. Mag. t. 9413 (1935).
E. himalaicus var. *chinensis* (Franch.) Diels in Engl., Bot. Jahrb. **29**: 508 (1900).
Distr. N. Burma, and W. & C. China.

E. campanulatus of Japan is extremely variable in the shape of leaves, the shape, size and colour of corollae, and the shape of calyx-lobes, but its leaves tend to be more roundish, obovate and shortly acuminate at the apex, and has often longer racemes, campanulate corollae (6) 7–11 mm broad, glabrous style and ovary, anthers only slightly scabrous, and ellipsoid capsules 5–6 (7) mm long.

Lyonia ovalifolia (Wall.) Drude and subsp. **Neziki** (Nakai et Hara) Hara.

In Himalayan *Lyonia ovalifolia,* the leaves are sometimes half-evergreen, subcoriaceous, 5–20 cm long, usually rounded at the base, with distinct impressed lateral nerves 7–14 on each side, and glaucous beneath with appressed brownish blunt hairs. The racemes are 5–15 cm long, the sepals are often ovate, and the corollae 8–16 mm long and pubescent, and the capsules are 4–5 mm in diameter. But some Himalayan plants have smaller leaves, flowers, and fruits, and approach to the Japanese ones to some extent. In Darjeeling, I observed a population with elongate oblong-lanceolate leaves which are not glaucous beneath.

The Japanese plants are generally separable from *L. ovalifolia* in having always deciduous thinner smaller leaves with fewer (6–8) less distinct lateral nerves which are generally patent-pilose beneath, shorter (3–6 cm) racemes, smaller (6–9 mm long) pilosulate corollae, and smaller capsules 3–4 mm in diameter. I should like to treat them as a geographical subspecies(1) of *L. ovalifolia.* Some intermediate forms occur in China and Formosa.

Ardisia macrocarpa Wall. is very near to *A. crenata* Sims of Japan and China, and *Myrsine capitellatus* Wall. corresponds to *M. Seguinii* Lév (Sieb. et Zucc.) Mez of and China.

The **Lysimachia japonica** group.

The Himalayan plants are related to *L. japonica* of Japan in having generally opposite leaves with minute dark purplish spots beneath, axillary flowers with a short pedicel which is recurved after anthesis, small corollae often as long as narrow lanceolate sepals, and filaments connate only in the basal part. But they are clearly distinguished from the latter in having stems with ascending hairs, always acute leaves, densely papillose erect filaments (Fig. 61), and 2n=48 or 84 chromosomes (see Kurosawa on page 662).

L. debilis Wall. is generally a larger plant with larger calyces and corollae with acutish lobes, and has 2n=84 chromosomes. The length of pedicels is considerably variable, and even the type collection, Wallich no. 1482, from Nepal collected by Wallich 1821 includes a few specimens with very short pedicels. Also in Kumaon and Simla, both short- and long-pedicelled (up to 15 mm long) plants are found.

L. ferruginea Edgeworth is another Himalayan race very closely allied to *L. debilis.* It differs from the latter by smaller leaves more densely hairy with shorter hairs, slightly smaller flowers, smaller pollen grains, and the chromosome number 2n=

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1) *Lyonia ovalifolia* (Wall.) Drude subsp. **Neziki** (Nakai et Hara) Hara comb. nov.
Andromeda elliptica Sieb. et Zucc. in Abh. Akad. Muench. **4** (3): 126 (1846).
Lyonia Neziki Nakai et Hara in Journ. Jap. Bot. **14**: 336 (1938).

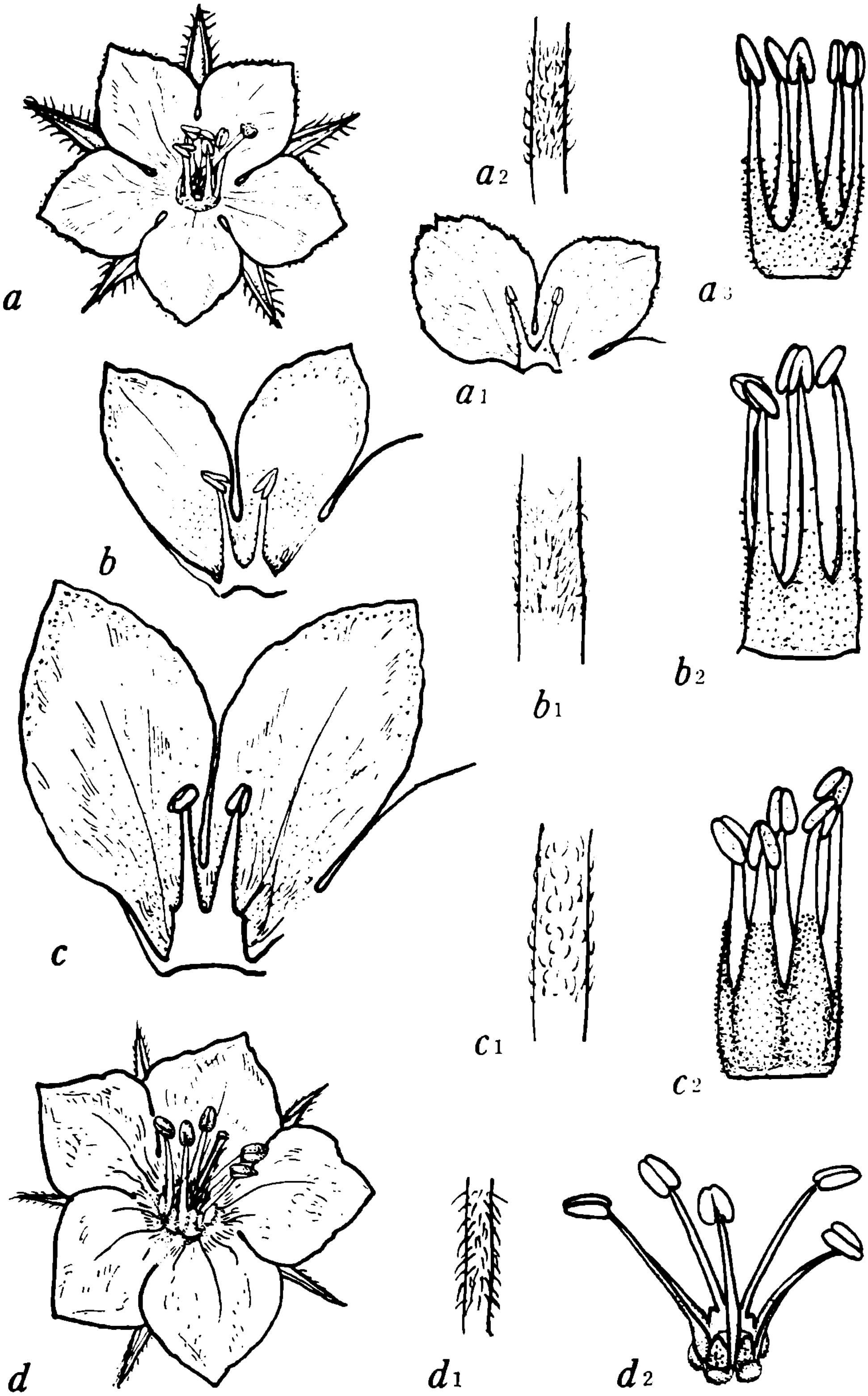

Fig. 61. a. *Lysimachia ferruginea*, from Pouwa, Nepal.
b. *Lysimachia debilis*, from Baroya Khimty, E. Nepal.
c. *Lysimachia congestiflora*, from Penlong La, Sikkim.
d. *Lysimachia japonica*, from Nachi, Japan.
a, d, flower, × 4; a_1, b, c, a part of corolla, × 4; a_2, b_1, c_1, d_1, a part of stems; a_3, b_2, c_2, d_2, stamens, × 8.

48.

L. congestiflora Hemsley which also occurs in Himalaya is quite distinct from other species of the group by less hairy stems, flowers congested at the top of stems, ascending fruiting pedicels, and also by the coarse reticulation on the surface of pollen grains.

Typical *Lysimachia japonica* Thunberg of Japan, Bonin, Formosa, and Korea has pubescent stems with retrorse hairs, more roundish leaves, and smoother filaments which are generally obliquely spreading, and have often a small tooth in the sinus between filaments. The size of flowers and the length of pedicels are also variable in Japan. The chromosome number is 2n=20 in all the Japanese material hitherto studied.

In Malaysia too, several races seem to occur. *L. microphylla* Merrill of Philippines is very close to *L. japonica* var. *papuana* A. Moore of New Guinea, and they have pubescent stems with recurved hairs, very small roundish minutely pubescent leaves, and small flowers. It is interesting that *L. japonica* var. *papuana* was reported by Borgmann (1964) to have 2n=20 chromosomes.

It became clear that *L. japonica* is rather an aberrant type in the group with a basic number of 5 probably derived from one of a polyploid series with a basic number of 6 which is common in the group.

In Gentianaceae, *Gentiana pedicellata* Wall. is closely allied to *G. squarrosa* Ledeb. of Japan, China, and East Siberia. The Himalayan specimens of *Swertia bimaculata* (Sieb. et Zucc.) Hook. f. et Thoms. agree well with the Japanese ones.

Tripterospermum volubile (D. Don) Hara and **T. japonicum** (Sieb. et Zucc.) Maxim.

I have reinstated the genus *Tripterospermum* in Bot. Mag. Tokyo **51**: 21 (1937), and also in my Enum. Sperm. Jap. **1**: 143 (1949), and the treatment has been followed by Satake (1951), Ohwi (1953 & 65), and Toyokuni (1963). Recently H. Smith (1965) also adopted it in his modified sense. The genus is distinguished from *Gentiana* not only by twining stems, but also by filaments all curved upwards at the apex, carnose collar-like disc surrounding the base of stipitate ovary, terete ovary without distinct suture lines, indehiscent baccate fruits, flattened triquetrous seeds narrowly winged on three ridges, and pollen grains with striate marking on the surface. While the genus *Crawfurdia*, in my opinion, should be united with *Gentiana*, and *C. speciosa* Wall. agrees with many other species of *Gentiana* in essential characters excepting twining stems.

Pterygocalyx volubilis Maxim. which has also twining stems is quite distinct in having pendulous tetramerous flowers, corollae without folded appendages between lobes, filaments abruptly bent outwards at the tip, fimbriate flabellate stigmas, dehiscent capsules, and pollen grains with coarse reticulation on the surface.

Tripterospermum volubile in its typical form has yellow-greenish or whitish corollae 2.2–3 cm long, styles 6–9 mm long and bifid at the apex, and succulent dark red oblong fruits 2–4.5 cm long 7–11 mm across with a stipe 1.5–2.5 cm long. A form with shorter styles 4–5 mm long and bifid to the middle is also collected here and there, for example Sinduwa, Ghatte, Akasay, Mai Majuwa, and Darjeeling. It is doubtful if this form merits recognition as a taxonomic unit. *Tripterospermum japonicum* of Japan has light mauve flowers, shorter bifid styles, and smaller fruits.

Cynoglossum zeylanicum (Vahl) Thunb. is widely distributed from India to Japan. *C. lanceolatum* Forsk. is represented in Japan by var. *formosanum* (Nakai) Hara which has larger flowers and fruits (see page 266).

In Labiatae, *Mosla dianthera* (Hamilt.) Maxim., *Elsholtzia ciliata* (Thunb.) Hylander, and *Teucrium viscidum* Blume are common to Himalaya and Japan. *Prunella vulgaris* L. of Himalaya has small flowers and is near to the typical European plant. Some Sikkimese plants have been referred to var. *hispida* (Benth.) Benth., but the latter can be typified by a race from Nilghiris of South India which has more densely pubescent stems and leaves, and larger flowers. In Japan, the species is much differentiated, and the most common race belongs to subsp. *asiatica* (Nakai) Hara (cf. Journ. Fac. Sci. Univ. Tokyo Bot. **6**: 369–370, 1956).

Clinopodium umbrosum (M.-Bieb.) K. Koch shows somewhat intermediate characters between *C. chinense* (Benth.) O. Kuntze and *C. micranthum* (Regel) Hara of Japan. *Ajuga lobata* D. Don closely resembles *A. japonica* Miquel of Japan. *Leucosceptrum canum* Smith was considered to be congeneric with the genus *Comanthosphace* of Japan and China by Kitamura and Murata in Acta Phytotax. Geobot. **20**: 166–168 (1962).

In Scrophulariaceae, many weedy species in paddy-fields and wet places are widespread from India to Japan. The group of *Mimulus nepalensis* Benth. including var. *japonica* Miquel was discussed by Yamazaki in Journ. Jap. Bot. **37**: 265–268 (1962). *Veronica cana* Wall. and *V. robusta* (Prain) Yamazaki are also closely allied to *V. Miqueliana* Nakai of Japan.

Yamazaki regarded the Japanese *Ellisiophyllum* as a variety of *E. pinnatum* (Wall.) Makino in Journ. Jap. Bot. **27**: 61 (1952). Our Himalayan specimens have longer densely hairy pedicels, larger flowers, and corollae which have dark yellow spots at the throat. The Japanese plants, var. *reptans* (Maxim.) Yamazaki, produce thickened white rhizomes in winter (Pl. 29 d), and have shorter less hairy pedicels, smaller calyces and corollae which have yellowish spots surrounded by longer stiff hairs.

As regards *Phryma Leptostachya* L., it is evident that the Himalayan, Japanese, and North American plants belong to one and the same species, but there are slight morphological differences among them (see Journ. Fac. Sci. Univ. Tokyo Bot. **6**: 377, 1956). The Japanese race, var. *oblongifolia* (Koidz.) Honda (var. *asiatica* Hara), although variable in the shape of leaves, has glabrescent calyces with shorter-spinulose upper lobes, rachises of spikes glabrescent or with very minute ascending hairs, often smaller corollae than those of the American one. In the Himalayan plants, the hairs on rachises and stems are more spreading, and the corollae are less exserted from the upper calyx-lobes, as compared with the Japanese ones.

The **Rubia cordifolia** group.

By our previous paper of 1963[1)], it became apparent that the group consists of several distinct species. As the lectotype of *R. cordifolia* L., we have selected the Dahurian plant described by Amman in Stirp. Rar. Ruthen. 19 (1739). This East Siberian plant has 4–10-verticillate leaves, greenish or yellowish flowers, and fruits becoming yellow-brown or orange and then turning black in full ripe. Although variable in the shape of leaves, it is widely distributed in Dahuria, Amur, Ussuri, Mongolia, N. & C. China, Korea, and S. W. Japan. The Japanese plants have leaves somewhat obtuse and abruptly acuminate at the apex, depressed globose fruits, and larger seeds 4–5.5 mm across, and it was proved that the cotyledons are hypogaeous, and the somatic chromosome number is 22.

In Eastern Himalaya at least two distinct races can be distinguished; that is, *R. Manjith* Roxb. and *R. Wallichiana* Decaisne. Roxburgh's type specimen of *R. Manjith* from Nepal is not extant at Kew or British Museum, but Icones Roxburghianae no. 1023 at Kew which can be considered as the type shows that it has madder-red flowers and deep red fruits. *R. Manjith* is very characteristic in having long acuminate 4-nate leaves hispidulous on the midrib, smaller brownish orange-red rotate flowers 2–3.5 mm in diameter, and smaller fruits 3–4 mm across which are dark orange or reddish at first, and become black at last. The cotyledons are epigaeous, and the somatic chromosome number is 66 (see page 663). While *R. Wallichiana* has slightly larger flowers which are greenish, yellowish, or sometimes dark purple, and slightly larger black fruits, and it is green in all parts, excepting flowers and fruits. It occurs generally at the higher altitudes than *R. Manjith.* The cotyledons are also epigaeous, and the somatic chromosome number is 44, or 132.

The Japanese 'Akane ', used as a red dye from old days, has long been confounded with the Himalayan plants. *R. Akane* Nakai has consistently 4-nate broad leaves which are ±cordate at the base, and almost smooth on the midrib, greenish or yellowish flowers 4–6 mm in diameter, and subglobose fruits 4–6 mm across and black in mature. The cotyledons are always hypogaeous, and the chromosome number is $2n=44$.

As illustrated on Plate 31, it is most remarkable that *R. Manjith* and *R. Wallichiana* both from Eastern Himalaya have epigaeous cotyledons, whereas *R. cordifolia* and *R. Akane* found in Japan have hypogaeous cotyledons. This difference in the mode of germination is considered to be important enough to separate the Japanese 'Akane ' specifically from the Himalayan one, although *R. Akane* closely resembles *R. Wallichiana* in other morphological characters.

In India and West China, the *R. cordifolia* group is very polymorphic, and besides the races above mentioned several geographical races are recognizable. *R. podantha* Diels from W. China is similar to *R. Manjith* in some respects, but the corollae are cleft only to the middle with a cup-shaped tube.

Rubia cordifolia of Wallich's Cat. no. 6209 in the Wallich Herbarium is a bad

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[1)] Hara and Kurosawa: Notes on the *Rubia cordifolia* group. Sci. Rep. Tohoku Univ. Biol. **29**: 257–259, t. 6–7 (1963).

mixture of several species, even including a very distinct *R. sikkimensis* Kurz (no. 6209, a. 2). The specimens no. 6209, a. 1 (Chainpur Hills 1810) and C (Silhet 1815) belong to *R. Manjith,* while no. 6209, b (Nepal 1821) is *R. Wallichiana* which was discussed above. No. 6209, e, f, and g seem to be *R. secunda* Moon which occurs in Madras district and Ceylon.

R. alata Wallich (Cat. no. 6208) is another species found in Bombay district. No. 6208, c, although the inflorescence and corollae are glabrous, is very near to *R. asperrima* Decaisne which is common in Kahmir and N. W. Himalaya.

The detailed critical studies on these races of the *R. cordifolia* group in a wide sense are much needed.

Galium hirtiflorum Requien is near to *G. pogonanthum* Franch. et Sav. of Japan and Korea.

Paederia foetida L. resembles, in the flowering stage, *P. scandens* (Lour.) Merrill which is widely distributed from Himalaya to Japan, but it differs markedly in fruit from the latter, as illustrated in Colour Plate 8, f–k.

In Caprifoliaceae, *Sambucus Hookeri* Rehder of Himalaya and *S. chinensis* Lindley of Japan and China belong to the *Sambucus javanica* group. *Viburnum cordifolium* Wall. corresponds to *V. furcatum* Blume of Japan. *V. erubescens* Wall. has the same sesame-like smell as that of *V. Sieboldi* Miquel of Japan.

Valeriana Hardwickii Wall. is allied to *V. flaccidissima* Maxim. of Japan.

Peracarpa carnosa (Wall.) Hook. f. et Thoms. and its varieties.

This monotypic genus is distributed from Himalaya to Japan, north to South Saghalien and South Kamtchatka, and south to Philippines (Fig. 62), and is variable especially in Japan in the shape and size of leaves and the size of seeds, as mentioned in Journ. Jap. Bot. **21**: 17–21 (1947).

In typical *P. carnosa* of Himalaya, the leaves are ovate, acute or shortly acuminate at the apex, dark green above and generally dark purplish beneath; the corollae are often smaller, 3.5–5 (–7) mm long, white with violet-purple veins; the chromosome number is 2n=30, and the rhizomes are slender and long creeping throughout the year.

In var. *circaeoides* (Fr. Schm.) Makino which is common in Japan, the leaves are more roundish and depressed, rounded or acutish at the apex, and green; the corollae are often larger 5–8 (12) mm long and generally white; the chromosome number is 2n=28; and the rhizomes of the lowland form are often much thickened at the nodes in summer and autumn (Pl. 29 a).

Intermediate forms between the two above mentioned, however, are found here and there. Even some Himalayan specimens form Bhutan and Nepal show somewhat intermediate characters. Var. *kiusiana* Hara from Kyushu of Japan closely resembles typical *P. carnosa* especially in the characters of leaves.

The Chinese plants have more roundish leaves and agree with var. *circaeoides,* and some specimens of China with small roundish leaves correspond to var. *pumila* Hara of Kyushu. On mountains of Formosa and Philippines, only var. *formosana* Hara with small acuminate leaves occurs.

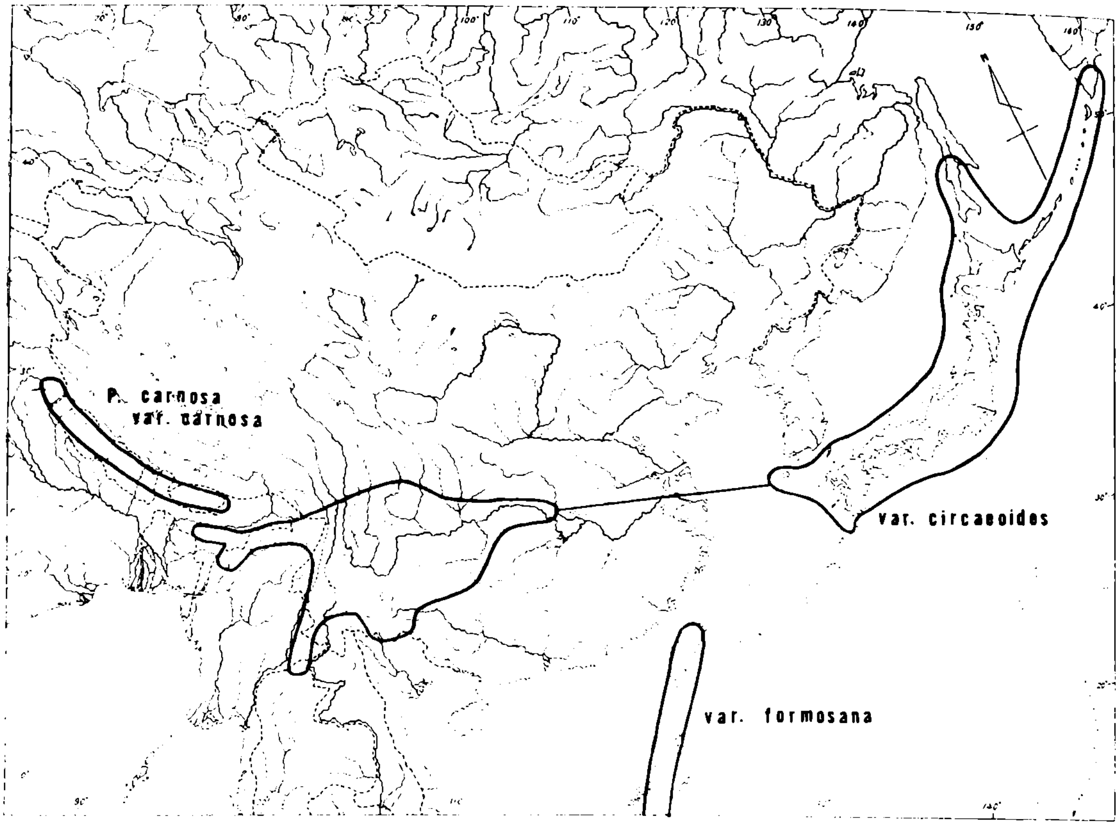

Fig. 62. Distribution map of *Peracarpa carnosa*.

In Compositae, *Anaphalis margaritacea* (L.) Benth. et Hook. f., *Artemisia japonica* Thunb., *Rhynchospermum verticillatum* Reinw., and *Senecio scandens* Hamilt. are common to Himalaya and Japan, except for some other weedy species. *Anaphalis Busua* (Hamilt.) Hand.-Mzt. is related to *A. sinica* Hance of Japan and China. Of widespread polymorphous *Picris hieracioides* L., the Himalayan plants belong to subsp. *kaimaensis* (Kitam.) Kitamura, and the Japanese ones mostly to subsp. *japonica* (Thunb.) Krylov and subsp. *kamtschatica* (Lebeb.) Hultén (cf. Kitamura in Mem. Coll. Sci. Kyoto Univ. B, **22**: 91–98, 1955).

MONOCOTYLEDONEAE

Gramineae, Cyperaceae, and Orchidaceae are excluded from this paper, since they have often been studied by specialists. Weedy species listed on page 628 are also omitted here.

The Himalayan and Japanese plants of *Acorus Calamus* L. seem to belong to the same race (see page 393), but it is doubtful whether they are truely indigenous to those districts, as they have been applied to medicial purposes from old days.

Streptolirion volubile Edgeworth is widespread from India to the south-western part of Japan.

In Liliaceae, various corresponding taxa belonging to many genera have been observed in Himalaya and Japan. For example, *Allium Prattii* C. H. Wright corresponds to *A. Victorialis* L. subsp. *platyphyllum* Hultén of Japan, China, and Amur, *Cardiocrinum giganteum* (Wall.) Makino to *C. cordatum* (Thunb.) Makino of Japan and Saghalin, *Paris polyphylla* Smith to *P. verticillata* M.-Bieb. of Japan, China, and Siberia, and *Ophiopogon intermedius* D. Don to *O. planiscapus* Nakai of Japan.

The relationship between *Clintonia udensis* Trautv. et Meyer of Japan, Korea, Amur, and North and Central China and its var. *alpina* (Kunth) Hara of Himalaya and West China was discussed in detail in Advanc. Front. Pl. Sciences **8**: 25 (1964) and Journ. Jap. Bot. **38**: 71 (1963). The differences between the two races are slight and continuous, so the Himalayan race can be treated only as a variety of *C. udensis*.

The **Lloydia serotina** group.

Lloydia serotina (L.) Reichenbach is almost uniform throughout its circumboreal area covering from Europe east to Japan, and western North America. The Japanese plants have erect or slightly inclining pedicels, whitish tepals with dark brownish purple veins, glabrous filaments, shorter styles (2–3.5 mm long), ovary roundish at the tip, and obovate-roundish capsules. The tepals are 10–14 mm long 3–5 mm broad, obtuse to roundish at the apex, and have a small transverse nectariferous fold above the base inside. These plants are identical with the European ones, and those from Mt. Wu-tai-shan of North China also belong to the same species.

In Himalayas and West China, however, the group is highly differentiated, and our collections include three different types. A collection from Phalut agrees with *L. serotina* in the shape and colour of flowers, glabrous filaments, and the shape of ovary, and its tepals have a small transverse fold above the base. Some individuals are typical *L. serotina*, while some have larger tepals attaining 18 mm long and 8 mm broad, and longer styles up to 10 mm long, and they well match the original illustration and specimen of *L. himalensis* Royle. Another one collected between Migothang and Nayathang is also very similar to *L. serotina* in general appearance, but has longer (6–7 mm) styles, and the middle vein of its tepals is only slightly thickened above the base without forming a transverse nectary. This type was referred by Handel-Mazzetti (1936) to *L. Mairei* Léveillé, but I wonder if it should be separated specifically from *L. serotina*.

The other type found around Jongri, Gamothang, and Migothang is very distinct in having nodding flowers, filiform bracts crowded in the upper part of stems, yellow tepals without nectary and dark orange towards the base inside, ±rhombic inner tepals much broader (4–8 mm wide) than the outer ones, filaments densely villose up to above the middle, styles 4–5 mm long, and acutish ovary attenuate to the style (Fig. 63, f). This type occurs in Nepal, Sikkim, S. E. Tibet, and N. Yunnan, and it is nearest to *L. Delavayi* Franchet. The type of *L. Delavayi* from the Tali range of N. Yunnan collected by Delavay has more caespitose habit, filaments pubescent in the lower half only, and tepals minutely pilose near the base inside. These differences are slight, and our specimens seem to be referrable to *L. Delavayi*. The plant also resembles *L. longiscapa* Hooker especially in its villose filaments. The holotype of *L. longiscapa* is not extant at Kew, but judging from the original description and Franchet's note, it has whitish tepals with brownish purple base, and ovary obtuse at the apex. It was described from Western Himalaya, and is also represented by such specimens from Nepal as Thaple Himal, Manaslu, and Jangla Bhanjang.

Lloydia tibetica Baker (1892), *L. oxycarpa* Franchet (1898), and *L. Forrestii* Diels (1912) are also allied to *L. Delavayi*. *L. tibetica* has flat leaves 2–4 mm wide with 5–7 nerves, tepals pilose on both sides of the middle vein, and ovary obtuse at the tip. *L. oxycarpa* has yellow erect flowers, smaller tepals 8–12 mm long 2–

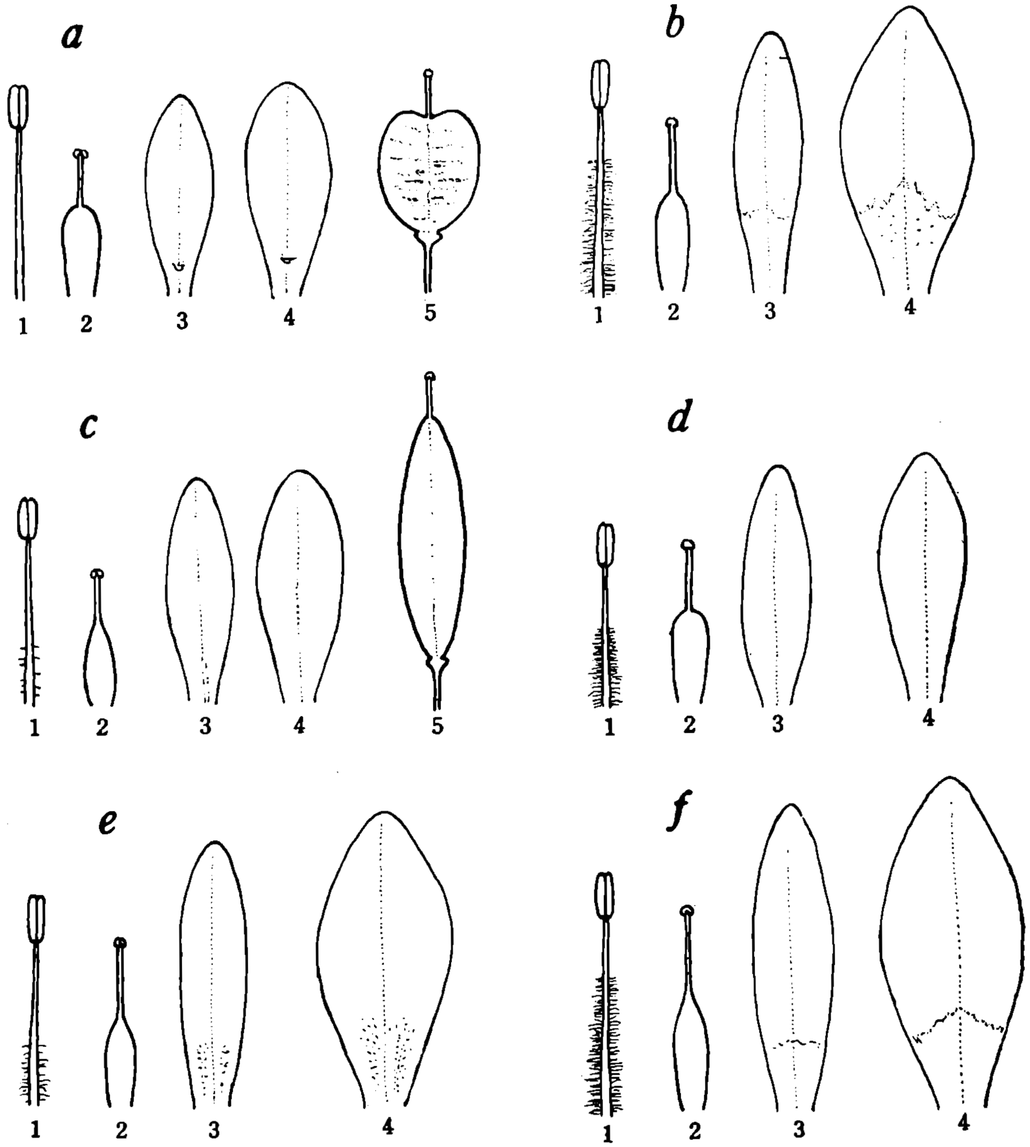

Fig. 63. Schematic figures showing the differences in the *Lloydia serotina* group. a. *Lloydia serotina* Reichb. b. *L. longiscapa* Hook. c. *L. oxycarpa* Franch. d. *L. Forrestii* Diels. e. *L. Delavayi* Franch., the typical form. f. *L. Delavayi*, the Himalayan plants.

1, stamen ; 2, pistil ; 3, outer tepal ; 4, inner tepal ; 5, capsule.

3.5 mm wide, slightly hairy filaments with short scattered hairs in the lower part, shorter styles, and oblong capsules acutish at the apex. *L. Forrestii* is very near to *L. Delavayi*, but has narrower (2–4 mm wide) tepals, and ovary obtuse at the tip, and it is somewhat intermediate between *L. Delavayi* and *L. oxycarpa.*

In Iridaceae, *Iris Clarkei* Baker is allied to *I. sanguinea* Donn of Japan and East Siberia. *Iris ensata* Thunb. reported from Sikkim by Rao Rolla in Bull. Bot. Surv. India **5**: 192 (1963) may be *Acorus Calamus.*

Burmannia liukiuensis Hayata of southern Japan seems to be conspecific with *B. nepalensis* (Miers) Hook. f.

CYTOLOGICAL STUDIES ON SOME EASTERN HIMALAYAN PLANTS

by

Sachiko KUROSAWA

This report deals with the results of my cytological investigations on flowering plants collected by the Botanical Expeditions to Eastern Himalaya of the University of Tokyo in 1960 and 1963. Also cytological data on some corresponding taxa from Japan are included here.

A part of the material was fixed in the field in Carnoy's fluid. A large number of living plants were brought home from the Expeditions, and have been cultivated in Tokyo and Karuizawa. Their root-tips were studied mainly by the smear method, after they had been pretreated with either paradichlorobenzene or water or oxyquinoline.

1) Paradichlorobenzene method (abbreviated as PD).

The root-tips are pretreated with a saturated solution of paradichlorobenzene for about 4 hours, or in a refrigerator at about 5°C for 4–24 hours and are left at a room-temperature for 10 minutes or more. Then transfer the material to a mixture of 9 parts 2% aceto-orcein solution and 1 part 1 N hydrochloric acid, and warm it gently in a watch-glass, then cool it at a room-temperature for at least 10 minutes. Place the stained root-tip on a dry slide, and quickly put a drop of 45% acetic acid on it, then warm it again gently over a micro-burner. Then remove acetic acid once by filter paper and again put a drop of acetic acid, and repeat this process two to four times. Put a small amount of glycerin jelly prepared by the Ikuse method¹⁾ on a cover slip and warm the cover slip very gently in order to dissolve the jelly. Then cover the material on the slide with the cover slip, and softly squash the root tip pressing the cover slip with jelly. In this case, attention should be given not to heat glycerin jelly too hot, and not to touch hot jelly with the material directly. When the material is well spread to observe chromosomes, the cover slip is sealed with cutex. The material prepared and sealed in this method can be kept in a good condition for more than two years. In modifying this method, a kind suggestion by Professor Shunji Watari was very helpful.

2) Water method (W).

The root-tips are put in water and kept in a refrigerator at about 5°C for about 24 hours. Then the material is treated in the same way as the paradichlorobenzene method above mentioned.

3) Oxyquinoline method (OQ).

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1) The Ikuse method for preparing glycerin jelly is described on page 2 of Ikuse's Pollen Grains of Japan (1956). For our purpose, however, the glycerin jelly is diluted two times with glycerin.

The root-tips are pretreated with 0.002 M solution of 8-hydroxyquinoline for four hours, and then follow the PD method as described above.

One of these three methods of prefixation is carefully selected depending on plant species. In general, PD or W method gave good results for the material with numerous small chromosomes, but in this case the chromosomes are liable to come off. To have a good spread for counting and analyzing the chromosomes, it is important to select a procedure according to the nature of the material and also to adjust the length of the pretreatment. In some cases, the meiotic division was also examined in pollen mother cells.

In the following chapter, the name of species is given first, then the cytological result of my studies, and the origin of the material follow. After the number of the figure, the method of pretreatment is denoted in parentheses by the abbreviation mentioned above. The previous cytological records are quoted, and the data on the allied species are also consulted.

The author wishes to express her most cordial thanks to Professor Hiroshi Hara, under whose directions the works have been carried on. Thanks are also due to all other members of the Expeditions for their kind help.

MATERIAL STUDIED

Houttuynia cordata Thunb. $2n=ca.\ 96$. Penlong La, Gangtok, Sikkim, 2100 m (Mar. 18, 1963).

This chromosome number agrees with that previously reported by Okabe (1934) and Mihara (1960) based on the Japanese material.

Asarum himalaicum Hook. f. et Thoms. $2n=26$. Thakma Khola, E. Nepal, 3000 m (Nov. 12, 1963); Gatribans-Tonglu, Singalila Range, 2800 m (Jun. 7, 1960).

This species belongs to the genus *Asarum* in a strict sense, and the chromosome number agrees with that of *A. canadense* L. (Gregory 1956; Ono 1960; Löve & Löve 1964). Most of the Japanese species of *Heterotropa* have $2n=24$ chromosomes.

Aconitum spicatum Stapf. $2n=32$. A peak east of Siling Tzokupa, 3300 m (Nov. 21, 1963).

Anemone vitifolia Hamilt. $2n=16=6A^{m}+4B^{sm}+2C^{st}+2D^{st}+2E^{t}$. Batasi, E. Nepal, 2500 m (Dec. 1, 1963). [Pl. 32 c (OQ), Fig. 64 a]

The number and karyotype of chromosomes agree with those of *A. hupehensis* Lemoine var. *japonica* (Thunb.) Bowles et Stearn (Kurita 1955) with purple-red semidouble flowers which is widely naturalized in Japan and also in Darjeeling.

Isopyrum adiantifolium Hook. f. et Thoms. $2n=ca.\ 28$. Senchal, Darjeeling, 2350 m (Dec. 28, 1963).

Chrysosplenium lanuginosum Hook. f. et Thoms. $n=7$, $2n=14=2A^{st}+4B^{st}+8C^{st}$. Bhuspate Danra, E. Nepal, 2900 m (Dec. 2, 1963). [Pl. 32 d & e (OQ), Fig. 64 b]

It is remarkable that this species has extraordinarily large 14 somatic chromosomes which are unique in the genus *Chrysosplenium*. It appears to be diploid with the basic number 7.

Chrysosplenium nepalense D. Don. 2n=24. Tiger Hill, Darjeeling, 2450 m (Jun. 23, 1960); Bandukay Bhanjang, E. Nepal, 3100 m (Dec. 3, 1963). [Pl. 32 a (PD)]

As previously reported by Hara and Kurosawa (1963 a), this species is tetraploid (2n=24), while an allied Japanese species *C. Grayanum* Maxim. collected from Sugadaira of C. Honshu has 22 chromosomes. [Pl. 32 b (PD)]

Tiarella polyphylla D. Don. 2n=14. Bhuspate Danra, E. Nepal, 2900 m (Dec. 2, 1963) [Fig. 64 d] (cf. Schoennagel 1931; Hamel 1953)

Dichroa febrifuga Lour. 2n=36. Darjeeling, 2100 m (Apr. 2, 1960). [Pl. 32 f (W)]

This is the first cytological report on the genus *Dichroa*.

Aruncus dioicus (Walt.) Fernald var. **triternatus** (Maxim.) Hara. 2n=18. Sandakphu, Singalila Range, 3600 m (Sep. 16, 1963).

Duchesnea indica (Andr.) Focke. 2n=84. Darjeeling, 2100 m (1960); Yoksam, Sikkim, 1700 m (May 16, 1960); below Siling Tzokupa, E. Nepal, 2000 m (Nov. 21, 1963).

The genus *Duchesnea* was cytotaxonomically investigated in detail by Hara and

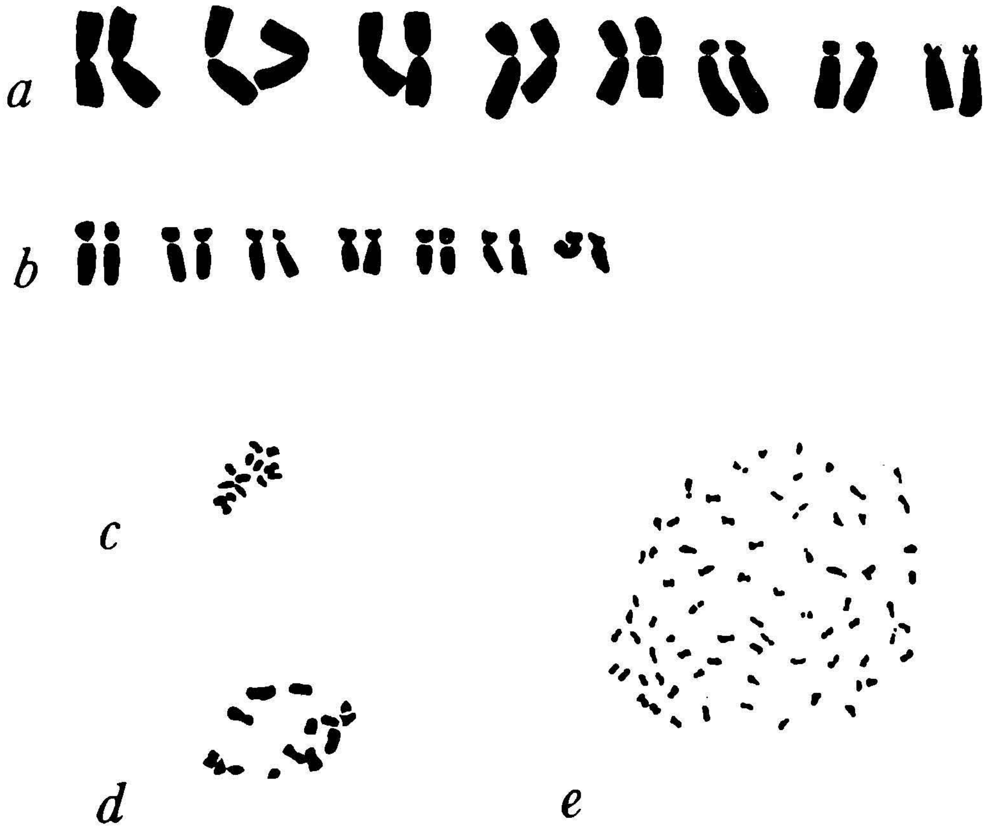

Fig. 64. Somatic chromosomes. a. *Anemone vitifolia*, × 1500. b. *Chrysosplenium lanuginosum*, × 1800. c. *Fragaria rubiginosa*, × 1500. d. *Tiarella polyphylla*, × 1500. e. *Hydrocotyle nepalensis*, × 1500.

Kurosawa (1959). The Himalayan plants hitherto studied are dodecaploid (2n=84) (cf. Hara and Kurosawa 1963 a & 64), but other polyploids may be found in India in future.

Fragaria nilgerrensis Schlecht. 2n=14. Gatribas-Tonglu, Singalila Range, 2800 m (Jun. 7, 1960).

Fragaria nubicola Lindley. 2n=14. Tonglu, Singalila Range, 3000 m (Jun. 7, 1960).

Fragaria rubiginosa Lacaita. 2n=14. Bhuspate Danra, E. Nepal, 2900 m (Dec. 2, 1963). [Fig. 64 c]

These three Himalayan species of *Fragaria* are differentiated morphologically at the diploid level. (cf. Staudt 1953).

Geranium nepalense Sweet. 2n=28. Darjeeling, 2100 m (1963). [Pl. 33 c (PD)]

The Himalayan plants are slightly different morphologically from the Japanese ones, but the chromosomes number is the same as that reported by Suzuka (1950) and Suzuka and Koriba (1950) based on the Japanese plant.

Oxalis Acetosella L. subsp. **Griffithii** (Edgew. et Hook. f.) Hara. 2n=22. Bhandukay Bhanjang, E. Nepal, 3100 m (Dec. 3, 1963).

As previously reported by Hara and Kurosawa (1965), the Himalayan plants are the same in chromosome number and karyotype as the Japanese ones.

Boenninghausenia albiflora (Hook.) Meisner 2n=20. Darjeeling, 2200 m (1963). [Pl. 33 b]

I have observed 2n=20 chromosomes also in root-tip cells of var. *japonica* (Nakai) Suzuki collected on Mt. Takao near Tokyo (Pl. 33 a). Sugiura (1936) and Suzuka and Koriba (1949) has reported that the Japanese plants have n=9 or 2n=18 chromosomes.

Stachyurus himalaicus Hook. f. et Thoms. 2n=24. Minchin Dhap-Mul Pokhari, E. Nepal, 2800–2500 m (Oct. 29, 1963). [Pl. 33 e (W)]

This is the first report on the chromosomes of the family Stachyuraceae. *Stachyurus praecox* Sieb. et Zucc. of Japan collected at Akita of N. Honshu also has the same chromosome number (Pl. 33 d).

Circaea repens Wall. 2n=22. Chitrey, E. Nepal, 2100 m (Oct. 24, 1963).

All the species of the genus so far studied including *C. alpina* L. and *C. lutetiana* L. have 2n=22 chromosomes.

Panax pseudo-Ginseng Wall. var **angustifolius** (Burkill) Li. 2n=ca. 48. Tonglu, Singalila Range, 3000 m (Sep. 16, 1964).

Regarding *P. japonicus* C. A. Meyer, Matsuura and Suto (1935) reported the gametic number 24 which was based on a material from Mt. Moiwa of Hokkaido, but was erroneously cited as the somatic number 24 by Darlington and Ammal (1945), and Wylie (1955). I have examined the root tip cells of *P. japonicus* collected from Mt. Buko of Middle Honshu, and confirmed the number 2n=48.

P. Ginseng C. A. Meyer has been reported to have 44 (Sugiura 1936), or 48 (Harn and Whang 1963) somatic chromosomes in the material cultivated for medicinal purpose.

Hydrocotyle nepalensis Hook. 2n=72. Senchal, Darjeeling, 2350 m

(Dec. 28, 1963). [Fig. 64 e (W)]

Hydrocotyle podantha Molenb. 2n=ca. 72. Darjeeling, 2100 m (Jun. 1960).

Sanicula elata Hamilt. 2n=16. Birch Hill, Darjeeling, 2000 m (Apr. 1960). The differences between this species and *S. chinensis* Bunge of Japan have been discussed by Hara and Kurosawa (1963 a & 64), but both species have 2n=16 somatic chromosomes.

Helwingia himalaica Hook. f. et Thoms. 2n=38. Above Ghum, Darjeeling, 2300 m (Apr. 4, 1960; Apr. 2, 1963). [Pl. 33 h (W)]

The Himalayan species was cytologically studied for the first time by Hara and Kurosawa (1965). It is noteworthy that *H. japonica* (Thunb.) Dietr. of Japan has been known as high polyploids with ca. 144 somatic chromosomes (Wanscher 1933) or 60 gametic chromosomes (Nakajima 1944). I have also examined the Japanese species collected from 3 different localities (Karuizawa, Jinmuji and Mt. Takao), and noticed that its somatic chromosome number is about 114 (Pl. 33 i, from Mt. Takao near Tokyo).

Lysimachia congestiflora Hemsley. 2n=48. Penlong La, Gangtok, 2100 m (Mar. 18, 1963). [Pl. 34 a (PD)]

Lysimachia ferruginea Edgew. 2n=48. Temi, Sikkim, 1700 m (Mar. 28, 1963) [Pl. 34 e]; Pouwa, Kathmandu, 1600 m (Oct. 9, 1963), [Pl. 34 d (PD)]; Tharpu, E. Nepal, 1200 m (Nov. 25, 1963). [Pl. 34 c (PD)]

Lysimachia debilis Wall. 2n=84. Darjeeling, 2150 m (Jun. 26, 1960); Taplejung, E. Nepal, 1800 m (Oct. 31, 1963); Baroya Khimty, E. Nepal, 2500 m (Nov. 11, 1963). [Pl. 34 b (PD)]

As reported by Hara and Kurosawa (1965), these three species form a polyploid series with the basic number of 6, and they are distinguished morphologically from each other. While *L. japonica* Thunb. common in Japan is separated from these species not only by outer morphological characters (see Hara on page 648), but also by the chromosome number (2n=20) with the basic number 5 (Pl. 34f, from Tôsenzan, Kyushu). It is interesting that other Japanese species of the group, *L. Tanakae* Maxim. and *L. Tashiroi* Makino (Pl. 34 g, from Hitoyoshi, Higo, Kyushu), have 2n=24 chromosomes which are considered to be tetraploid with the basic number of 6.

Prunella vulgaris L. 2n=28. Penlong La, Gangtok, 2100 m (Mar. 18, 1963).

Ellisiophyllum pinnatum (Wall.) Makino. 2n=18. Bhuspate Danra, E. Nepal, 2900 m (Dec. 2, 1963). [Pl. 36 a (OQ)]

E. pinnatum var. *reptans* (Maxim.) Yamazaki of Japan has the same number of chromosomes (Pl. 36 b). It is noteworthy that a different count of 2n=16 has recently been reported by Borgmann (1964) based on the material from East New Guinea (alt. 2900 m).

Phryma Leptostachya L. var. **oblongifolia** (Koidz.) Honda (var. *asiatica* Hara). 2n=28. Godavari, Kathmandu, 1500 m (Sep. 18, 1963). [Pl. 33 g (PD)]

The chromosomes are the same in number and karyotype as those of the Japanese plants (Pl. 33 f, from Karuizawa, C. Honshu) and also of typical *P. Leptostachya* of the eastern part of North America n=14 (Cooper 1941). The report n=14 by Sugiura (1936) was erroneously cited 2n=14 by Darlington and Ammal, and Wylie.

Rubia Manjith Roxb. 2n=66. Darjeeling, 2150 m (1960); Namchi, Sikkim, 1700 m (1962) [Pl. 35 d (W)]; Ghatte, E. Nepal, 1600 m (Nov. 16, 1963).

Rubia Wallichiana Decaisne. 2n=44. Rabong La, Sikkim, 2200 m (Mar. 28, 1963). [Pl. 35 c (PD)]

2n=ca. 132. Senchal, Darjeeling, 2400 m (Apr. 1963) [Pl. 35 f (PD)]

Rubia sikkimensis Kurz. 2n=ca. 132. Below Yektin, E. Nepal, 1400 m (Nov. 30, 1963). [Pl. 35 e (W)]

The *Rubia cordifolia* group has been studied by Hara and Kurosawa (1963 b). *Rubia cordifolia* L. distributed from temperate Eastern Siberia and China to the south-western part of Japan is diploid (Pl. 35 a). *Rubia Akane* Nakai of Japan is tetraploid (2n=44, Pl. 35 b from Karuizawa of Central Honshu), and its cotyledons are hypogaeous. Whereas all the Himalayan plants so far studied have epigaeous cotyledons (see page 652, Plate 31). *Rubia Manjith* Roxb. which has often been confounded with the Japanese species has 66 somatic chromosomes. While *Rubia Wallichiana* Decaisne which closely resembles *R. Akane* of Japan morphologically seems to include two races; one with 44 and the other with 132 somatic chromosomes. *Rubia sikkimensis*, a very distinct robust species endemic to E. Himalaya and N. Burma, is also a high polyploid.

Sambucus adnata Wall. 2n=36. Bhuspate Danra, E. Nepal, 2900 m (Dec. 2, 1963). [Pl. 36 g (OQ)]

Sambucus Hookeri Rehder. 2n=36. Ghatte–Khebang, E. Nepal, 1600–2400 m (Nov. 19, 1963). [Pl. 36 h (PD)]

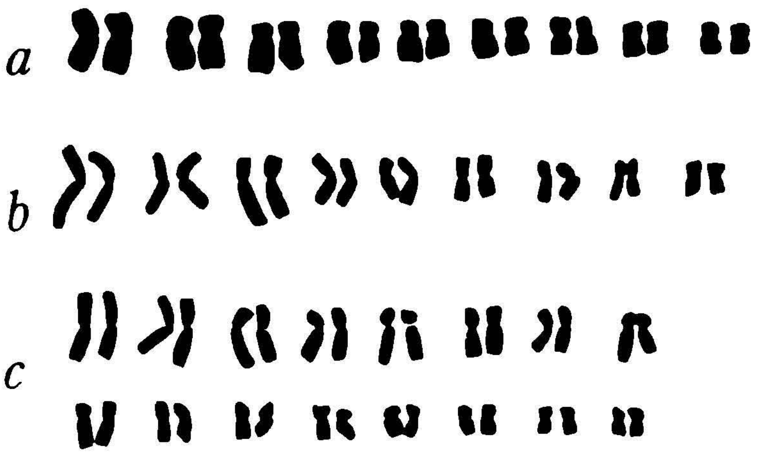

Fig. 65. Somatic chromosomes. a. *Viburnum coriaceum*, × 1500. b. *V. Mullaha*, × 1500. c. *V. erubescens*, × 1500.

In the *Sambucus javanica* group, 2n=36 has been recorded for *S. chinensis* Lindley by Suzuka (1950), *S. formosana* Nakai (n=18) by Chuang and al. (1963), and *S. javanica* Reinw. by Bowden (1940). I have also confirmed that *S. chinensis* collected at Jinmuji of Central Honshu has 36 somatic chromosomes.

Viburnum coriaceum Blume. 2n=18. Ghatte-Khebang, E. Nepal, 1600-2400 m (Nov. 19, 1963). [Pl. 36 d (PD), Fig. 65 a]

Viburnum erubescens Wall. 2n=32. Mai Majuwa-Mai Pokhari, E. Nepal, 1600 m (Dec. 4, 1963). [Pl. 36 f (W), Fig. 65 c]

Viburnum Mullaha Hamilt. 2n=18. Bhuspate Danra, E. Nepal, 2900 m (Dec. 2, 1963). [Pl. 36 e (W), Fig. 65 b]

2n=18 for *V. coriaceum* and 32 for *V. erubescens* have already been reported by Egolf (1962) based on cultivated materials.

Valeriana Hardwickii Wall. 2n=14. Baroya Khimty, E. Nepal, 2600 m (Nov. 11, 1963). [Pl. 36 c (PD)]

Mehra and Sobt (1955) recorded n=28 for *V. Hardwickii*, and further studies on the group are needed.

Peracarpa carnosa (Wall.) Hook. f. et Thoms. 2n=30. Birch Hill, Darjeeling, 2100 m (1960; Mar. 1963) [Pl. 36 j (PD)]; Penlong La, near Gangtok, Sikkim, 2100 m (Mar. 1963).

This number was for the first time reported by Hara and Kurosawa in 1965. The Japanese plants are very variable, and the plant collected from Mt. Iwaki of N. Honshu has 28 somatic chromosomes [Pl. 36 i (OQ)].

Arisaema speciosum (Wall.) Martius. 2n=28. Penlong La, Sikkim, 2100 m (Mar. 1963). [Pl. 37 a (PD)]

A. speciosum var. **mirabile** (Schott) Hara. 2n=28. Dhankuta, E. Nepal, 1200 m (Oct. 1963).

Arisaema exappendiculatum Hara. 2n=28. E. Nepal (1963). [Pl. 37 b (PD)]

Aletris sikkimensis Hook. f. 2n=26. Diorali Bhanjang, E. Nepal, 3400 m (Nov. 14, 1963). [Pl. 37 c (W)]

It is noteworthy that this is a diploid species. *Aletris foliata* (Maxim.) Bureau et Franch. and *Metanarthecium luteo-viride* Maxim. of Japan are tetraploid with 52 somatic chromosomes.

Allium Prattii C. H. Wright. n=16. Gamothang, Sikkim, 3750 m (May 28, 1960). See Hara and Kurosawa, 1963 a.

The *Allium Victorialis* group is distributed widely in Eurasia. *A. Victorialis* L. (in a strict sense) west of Baical and Western Himalaya has n=8 chromosomes, but its subsp. *platyphyllum* Hultén (*A. latissimum* Prokhanov) of Easternmost Siberia, North China, and Japan has n=16.

Cardiocrinum giganteum (Wall.) Makino. 2n=24. Darjeeling, 2200 m (Dec. 26, 1963). [Pl. 38 a (PD), Fig. 66 a]

This number agrees with that of the Japanese plants, *C. cordatum* (Thunb.) Makino (Takamine, 1915; Sato, D., 1942), and its var. *Glehni* (Fr. Schm.) Hara (Matsuura and Suto, 1935).

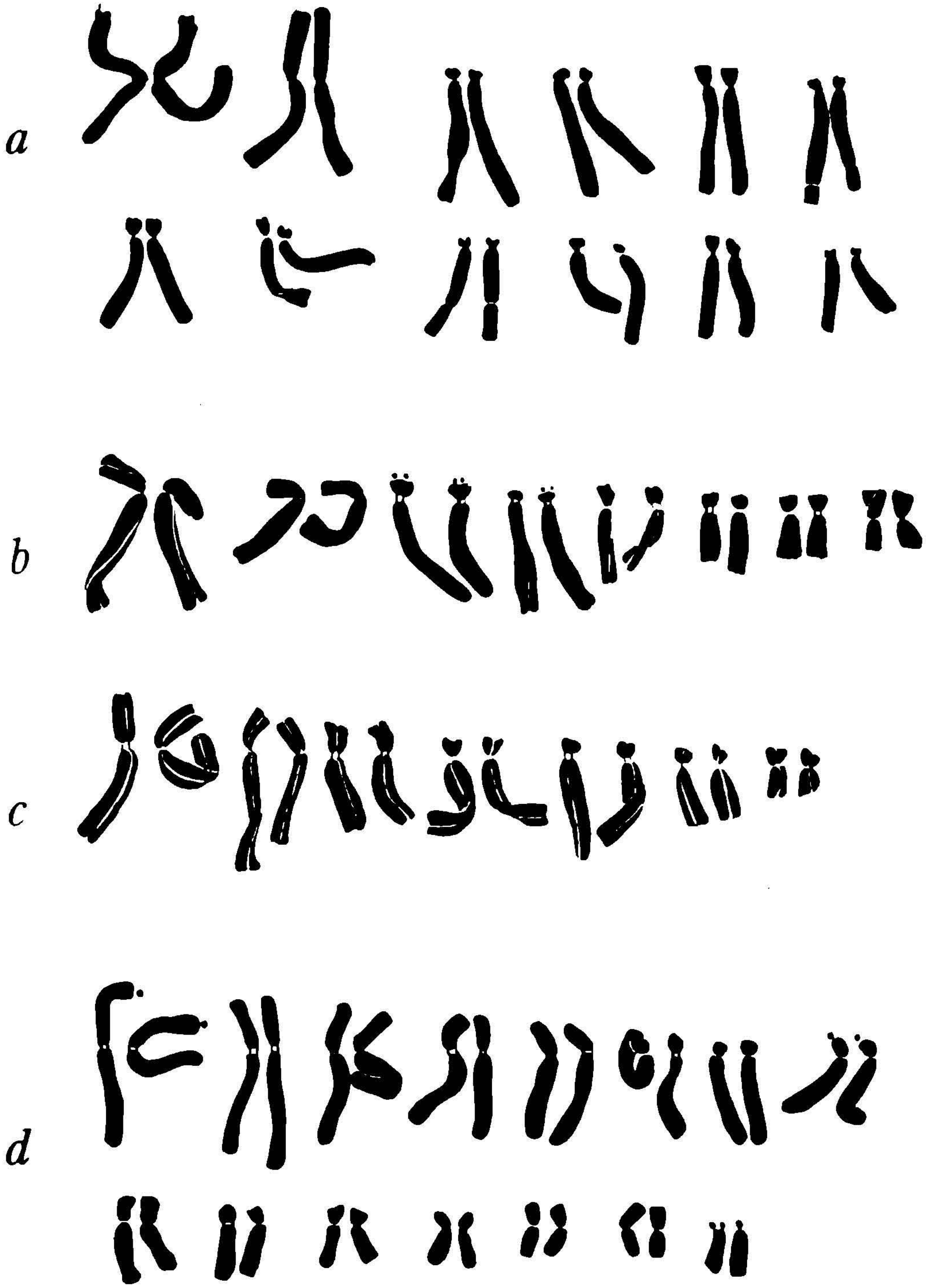

Fig. 66. Somatic chromosomes. a. *Cardiocrinum giganteum*, × 1200. b. *Disporum cantoniense*, 2 n = 16, × 1200. c. *D. cantoniense* var. *parviflorum*, 2 n = 14, × 1200. d. The same, 2 n = 30, × 1200.

Chlorophytum arundinaceum Baker. 2 n = 84. In pine forests, Dhankuta, E. Nepal, 1200 m (Oct. 19, 1963). [Pl. 37 e]

Chlorophytum nepalense (Lindl.) Baker. 2 n = 56. Halhale Bhanjang, E.

Nepal, 2800 m (Dec. 1, 1963). [Pl. 37 f (W)] (cf. Sharma et Chatterji 1958).

$2n=84$ for *C. arundinaceum* is the highest chromosome number hitherto recorded in the genus.

Clintonia udensis Trautv. et Mey. var. **alpina** (Kunth) Hara. $n=14$. Phalut, Singalila Range, 3500 m (Jun. 1960). See Hara and Kurosawa, 1963 a.

The chromosomes of the Himalayan plants agree with those of *C. udensis* from Japan in number and karyotype (Matsuura and Suto 1935; Sato, D. 1942).

Disporum cantoniense (Lour.) Merr. var. **parviflorum** (Wall.) Hara. $2n=14$. Garhi Danra, E. Nepal, 2200 m (Oct. 13, 1963). [Pl. 38 d (W), Fig. 66 c]

$2n=30$. Darjeeling, 2100 m (1960). [Pl. 38 c (PD), Fig. 66 d]

D. cantoniense has been previously reported by Hasegawa (1932) and Mehra and Pathania (1960) to have 16 somatic chromosomes, although slight differences have been observed between the karyotype of the Japanese and Himalayan plants. I have cytologically reexamined the plant which was introduced from China in old days and has long been cultivated in Japan, and noticed the same karyotype [Pl. 38 b (W), Fig. 66 b], as reported by Hasegawa.

However, it is remarkable that our two Himalayan collections of the species show different chromosome numbers. The plant grown in Tokyo from seeds collected at Garhi Danra has 14 somatic chromosomes, consisting of 5 pairs of long and 2 pairs of medium-sized chromosomes (Fig. 66 c). While the other plant brought back from Darjeeling has 30 chromosomes, although two of them can be considered as B-chromosomes (Fig. 66 d). More detailed cytotaxonomical studies on Himalayan materials are much needed. (cf. Therman 1956).

Paris polyphylla Smith. $2n=20=4A^{m}+4B^{sm}+4C^{sm}+8D^{st}$. Senchal, Darjeeling, 2300 m (Apr. 1960). [Pl. 39 a (PD), Fig. 67 b]

P. polyphylla var. **brachystemon** Franch. $2n=20$. Bhandukay Bhanjang, E. Nepal, 2900–3100 m (Dec. 3, 1963).

P. polyphylla var. **appendiculata** Hara. $2n=10$. Nayathang, Sikkim, 3300 m (Jun. 1, 1960).

In this species, two chromosomal races ($2n=10$ and 20) have been recorded by Malik (1961). It is interesting that tetraploid are found in our two collections: one normal form from Senchal (Fig. 67 b), and the other from Bhandukay Bhanjang which belongs to var. *brachystemon* with narrow leaves attenuate at the base to a short petiole, whitish along veins above, and dark purplish beneath. All other plants of the species hitherto examined cytologically are reported to be diploid sometimes with 1–2 B-chromosomes (Darlington, 1941; Larsen, 1963), including *P. formosana* Hayata from Formosa (Gotoh and Kikkawa 1937). The material kindly sent from Mr. Burtt of Royal Botanic Garden, Edinburgh was also diploid with $2n=10+1$ B chromosome$=2A^{m}+2B^{sm}+2C^{sm}+4D^{st}+1$ [Pl. 39 b, Fig. 67 a (PD)]. Morphological and chromosomal variations in this species need further investigations in the field.

Polygonatum cirrhifolium (Wall.) Royle. $2n=30$. Bhuspate Danra, E. Nepal, 2900 m (Dec. 2, 1963). [Pl. 40 f (W), Fig. 68 a]

Polygonatum verticillatum Allioni. $2n=30$. Sandakphu, Singalila Range, 3600 m (Sep. 16, 1964). [Pl. 40 e (W)]

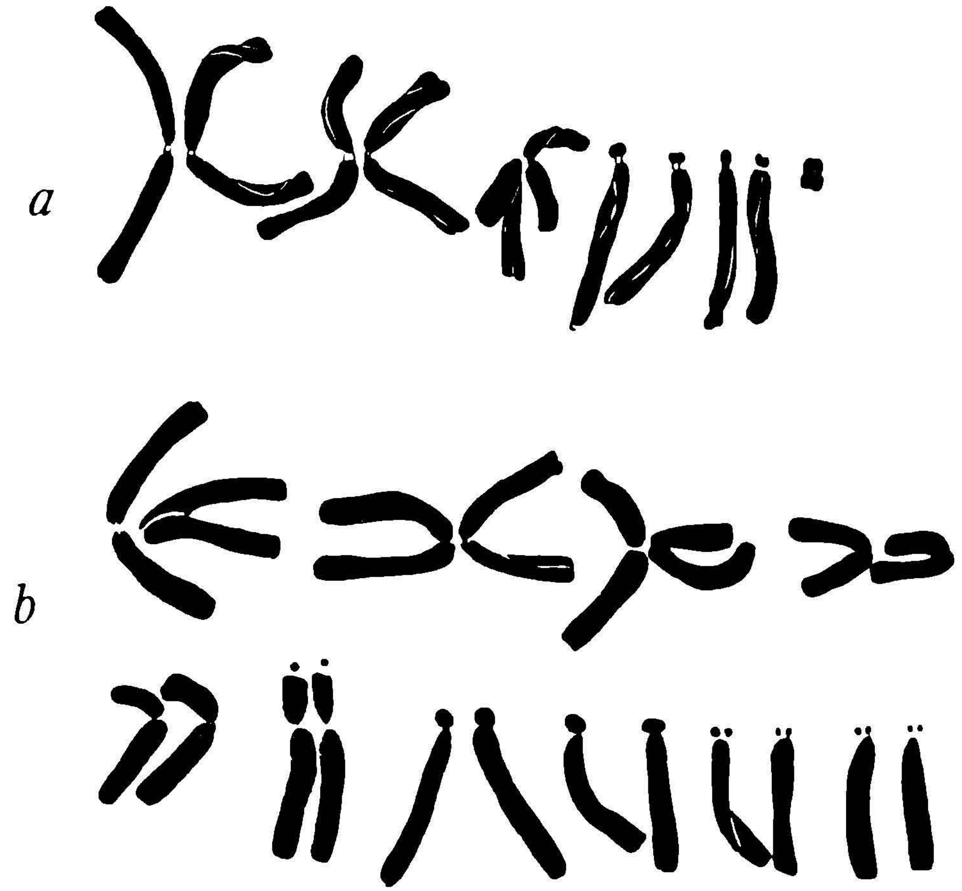

Fig. 67. Somatic chromosomes of *Paris polyphylla*. a. From Edinburgh Botanic Garden, 2 n = 10 + 1 B, × 1200. b. From Senchal, 2 n = 20, × 1200.

Polygonatum oppositifolium (Wall.) Royle. 2 n = 30. Chitray, E. Nepal, 2100 m (Oct. 23, 1963) [Pl. 40 d (W), Fig. 68 b]; Lloyd Botanic Garden, Darjeeling (1963) [Pl. 40 c (W)].

Polygonatum punctatum Royle. 2 n = 30. Bhandukay Bhanjang-Mai Majuwa, E. Nepal, 3100–1600 m (Dec. 3, 1963) [Pl. 40 a (W), Fig. 68 c]; Tendong Peak, Sikkim, 2500 m (Mar. 26, 1963) [Pl. 40 b (W)].

These numbers differ from the previous reports that *P. oppositifolium* from Darjeeling has 18 gametic chromosomes (Arora 1962), *P. verticillatum* has 28, 60 or ca. 90 (Therman 1953) and 66 somatic chromosomes (Mehra and Pathania 1960), and *P. cirrhifolium* has 38 somatic chromosomes (Kumar 1959). It is interesting that *P. Hookeri* Baker of alpine Himalaya has also been reported to have 2 n = 30 chromosomes. These species, however, bear fruits freely, and can be considered as diploid.

Smilacina fusca Wall. 2 n = 72. Darjeeling, 2100 m (Apr. 1960). [Pl. 39 d (W), Fig. 68 e]

Smilacina oleracea Hook. f. et Thoms. n=18. Between Sandakphu and Tonglu, Singalila Range, 3000–3500 m (Jun. 1960). See Hara and Kurosawa (1963 a).

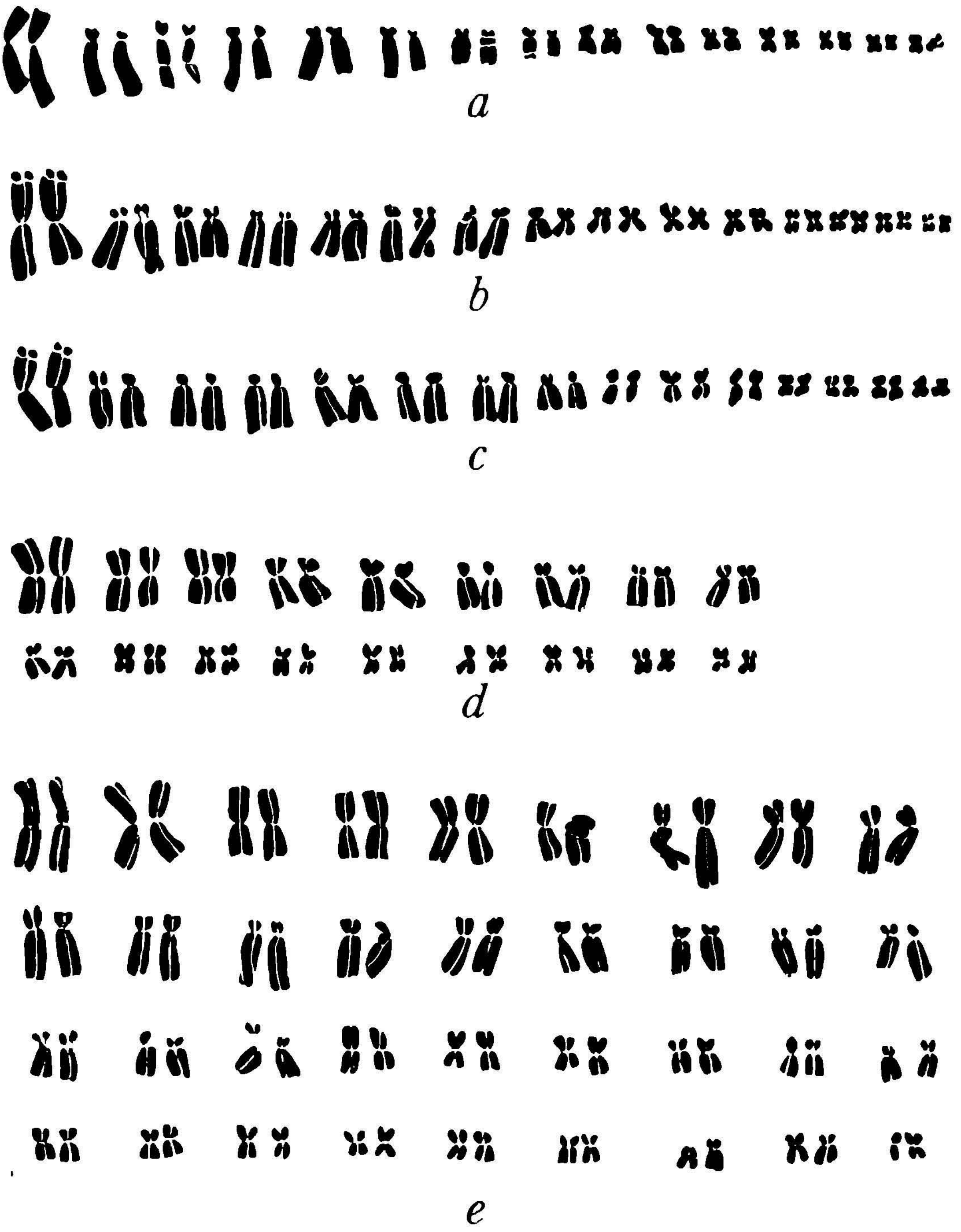

Fig. 68. Somatic chromosomes. a. *Polygonatum cirrhifolium*, × 1400. b. *P. oppositifolium*, × 1400. c. *P. punctatum*, × 1400. d. *Smilacina purpurea*, × 1200. e. *S. fusca*, × 950.

Smilacina purpurea Wall. $2n=36=\overset{6}{\cancel{3}}A^{m}+\overset{12}{\cancel{6}}B^{st}+\overset{10}{\cancel{5}}C^{st}+\overset{8}{\cancel{4}}D^{m}$. Sandakphu, Singalila Range, 3500 m (Sep. 16, 1964). [Pl. 39 c (W), Fig. 68 d]

Smilacina fusca is an octoploid species reported by Hara and Kurosawa (1963 a) for the first time in the genus. Its somatic chromosomes consist of 6 pairs of large chromosomes with a median centromere, 12 pairs of medium-sized ones with a subterminal centromere, 10 pairs of small ones with a subterminal centromere, and 8 pairs of small ones with a median centromere (Fig. 68 e). Then Kawano and Iltis (1963) also observed octoploidy in *S. racemosa* of Wisconsin, N. America.

n=18 was reported for *S. purpurea* from Simla by Mehra and Pathania (1960).

Belamcanda chinensis (L.) DC. 2n=32. Godavari, Kathmandu, 1600 m (Sep. 18, 1963). [Pl. 37 d (OQ)]

Iris Clarkei Baker. 2n=38. Tonglu, Singalila Range, 3000 m (Sep. 17, 1964).

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87	9	*A. narcissiflora*	*A. narcissifolia*
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314	8	**succirubra**	**succrirubra**
345	13	*uliginosus*	*ulginosus*
418	13 & 21	Fig. 27	Fig. 28
424	5 & 10	Fig. 28	Fig. 27
542	15	*Sph. cymbifolium*	*Sph. cymbifolim*
621	22	**Hymenochaete**	**Hymenchaete**
628	5 (from below)	Torrey	Hegelm.
648	22	Lév. of Japan	Lév (Sieb. et Zucc.) Mez of

DETAILED MAP OF THE EXPLORING COURSES